

WIRED

June 1997

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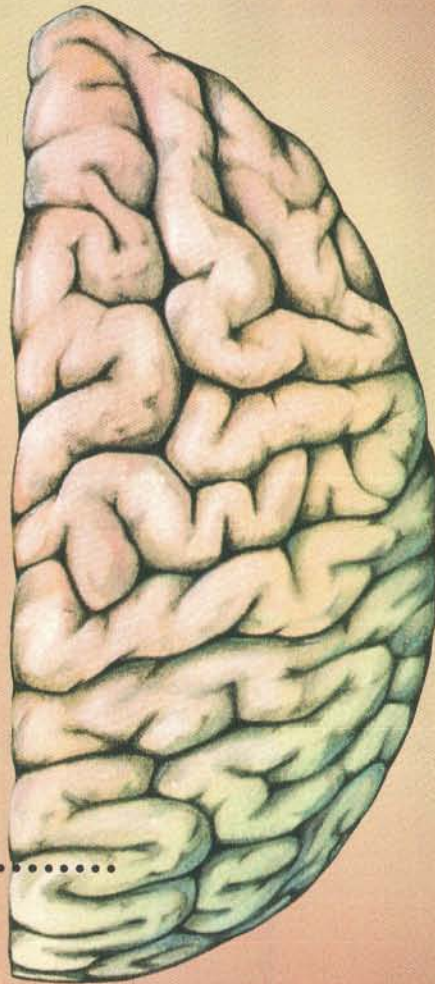
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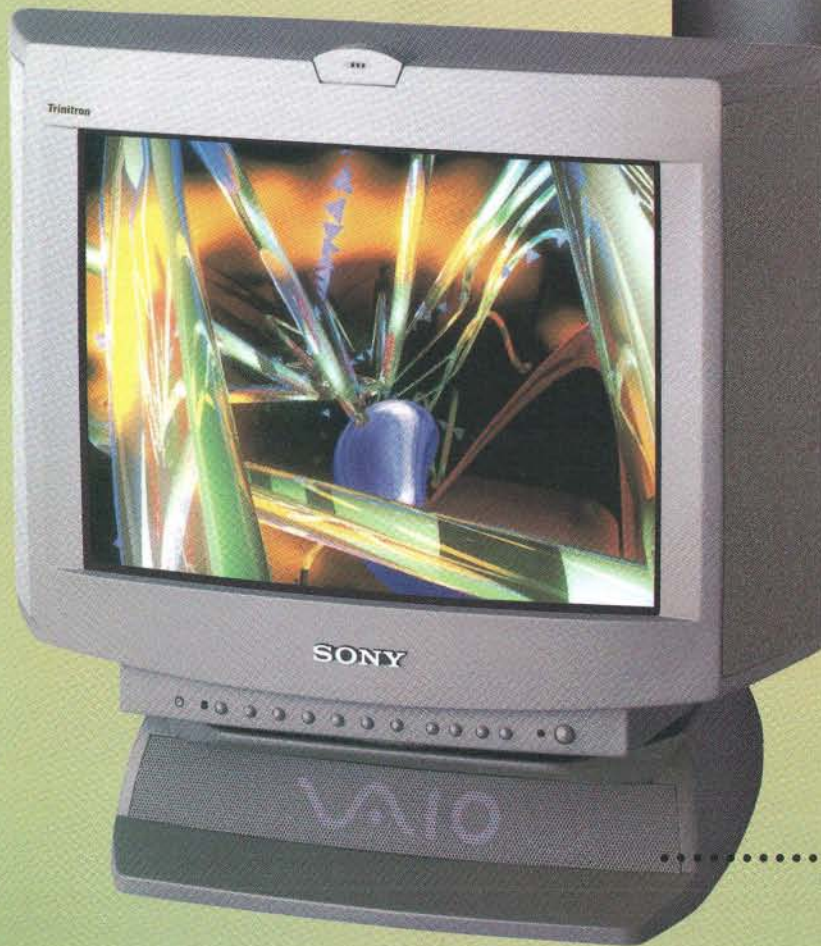
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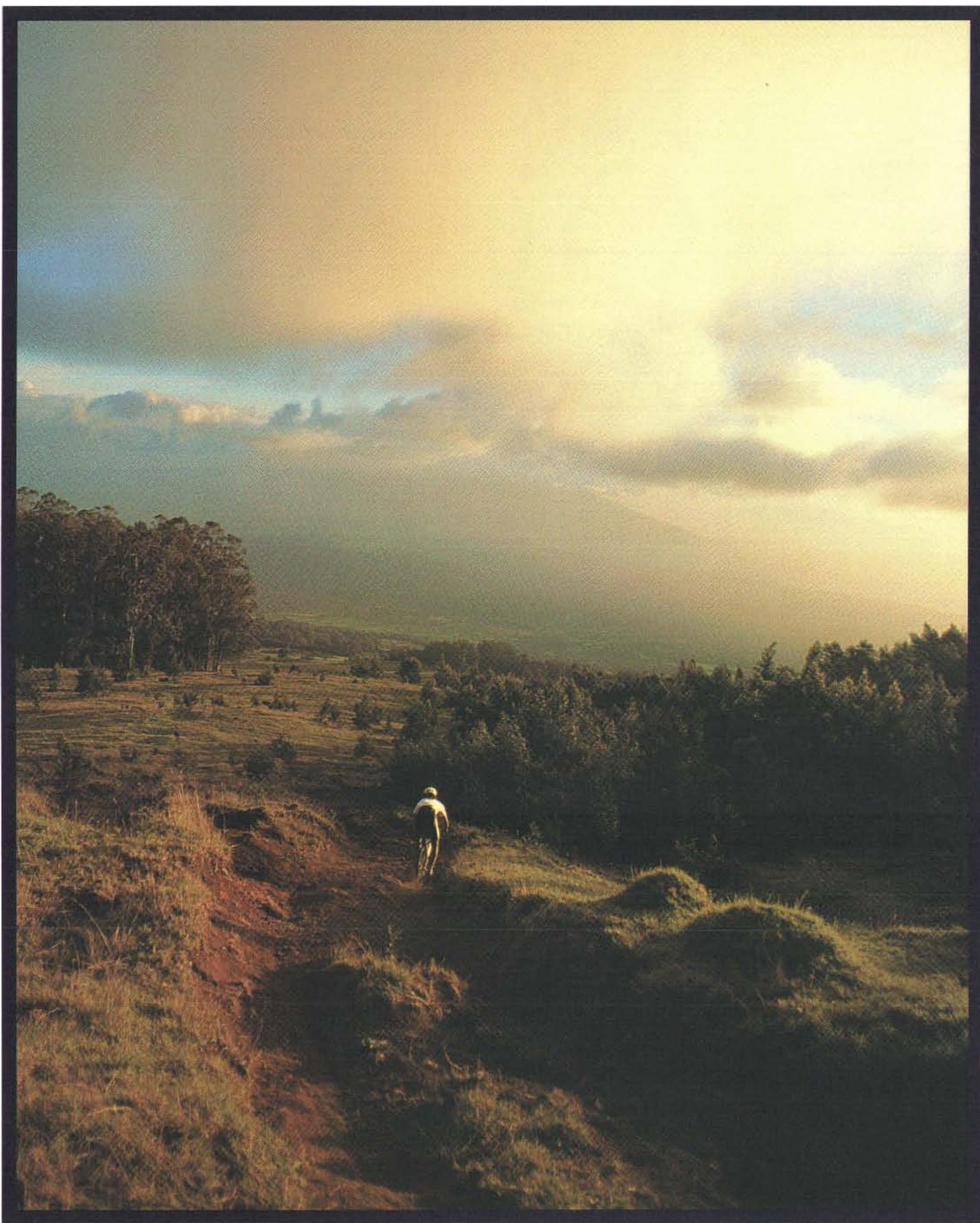


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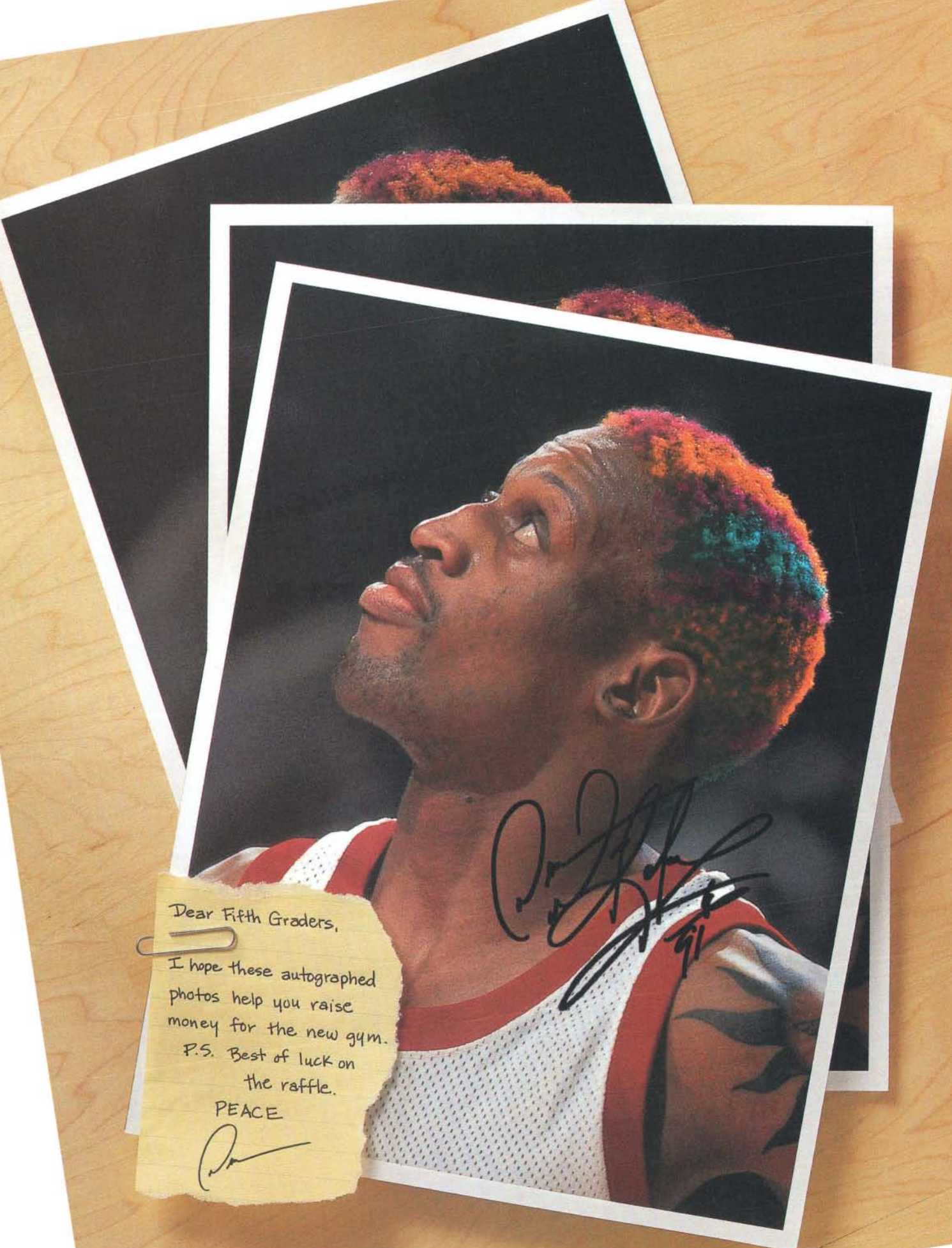
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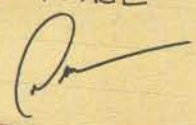
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now what?”
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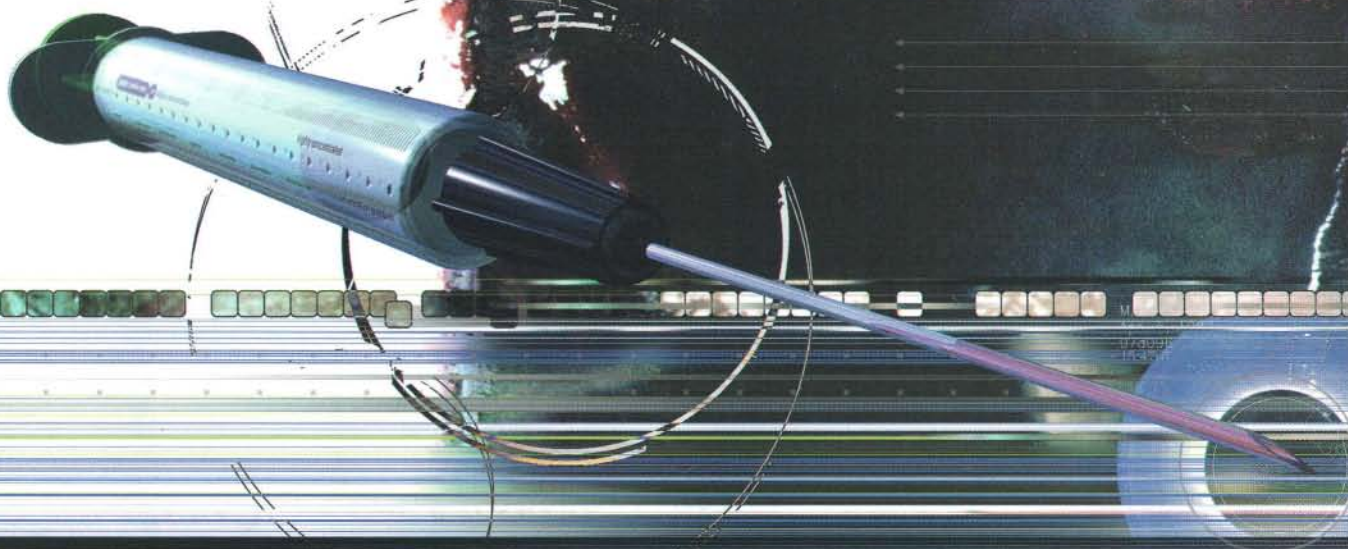
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Cultural schizophrenia, the modern condition born of a

"bellmation" can be found in

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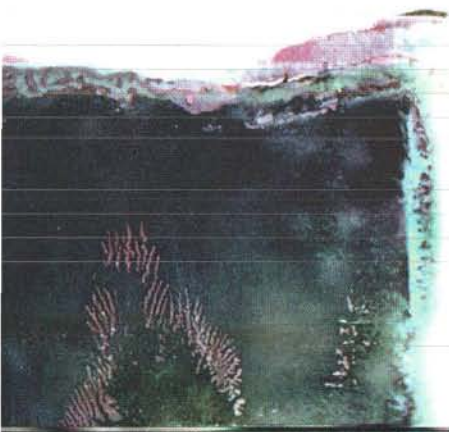
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軟實的精神 (Soft Spirit)

ACHTUNG

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養蜂の精神分裂

教養の精神分裂
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教養的精神分裂症

教養的精神分裂症

。態度と行動や、実際の世界と我々が
近代状況。

は、社会が将来の事柄に対してどの様に行動に移すのか、
時にいつでも起こる。

ワッツ・ワッカー

Cultural schizophrenia occurs when
attitudes and behaviors, cultural schizophrenia
and behaviors, between the world as it is presented and the world as we insist it to be.
Cultural schizophrenia occurs in the society because of the
attitudes and behaviors in the
Watts and Jim Taylor

The New York Times

NEW YORK, SUNDAY, MARCH 16, 1997



Building	Room No.	Container Type
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Jim Taylor

"I guess I've just been 'Medicated'."

CULTURAL
SCHIZOPHRENIA

Lust

Cultural schizophrenia occurs whenever society begins to reinvent its vision of how it will conduct affairs in the future. - Jim Taylor and Watts Wacker, page 100



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Look for URLs that begin

www.wired.com/5.06/

throughout this issue
to connect with the readers
and creators of *Wired*.



53

The Netizen: Telco Terrorism

If the Baby Bells get their way, you'll pay by the minute and through the nose for the privilege of logging on. But the Net has an unlikely defender: the FCC.

By Declan McCullagh



114

101 Ways to Save Apple



122

The McCain Mutiny

Senator John McCain was the lone GOP dissenter to the 1996 Telecommunications Act. He hates telecom lobbyists, wants to auction broadcasters' spectrum, and thinks crypto policy can be brokered. Oh, and he's now the chair of the Commerce Committee, which oversees telecom policy.

By Todd Lappin



130

In the Zone

They could have been recruited in the gyms of the best engineering schools. The techno-jocks at Starwave have created a unique culture — and made ESPN SportsZone the Number One destination site on the Web.

By David Diamond

context



124

F/Xtravaganzas

A preview of this summer's big special effects movies.

By Paula Parisi

Cover:
Concept by John Plunkett
Illustration by Tony Klassen

Latin translation courtesy
of Reverend David T. Stark

Introduction: The Attik



134

Breeding Edge

Using an SGI Indigo2 and his own genetic algorithms, Steven Rooke breeds fantastical Tolkienesque landscapes – literally.

By Jackie Bennion



136

From Bedroom to Big Time

This January, musician Jyoti Mishra – aka White Town – recorded “Your Woman” in his bedroom using an old multitrack Tascam and an Atari. Four weeks later, it entered the UK charts at Number One.

By Daniel Pemberton

5.06

WIRED

June

1997

ELECTROSPHERE

94 **Name-o-rama™** By Alex Frankel

100 **Speak the Future**
By Jim Taylor and Watts Wacker

IDÉES FORTES

109 **In Vitro Veritas** By Nathan Myhrvold

110 **Memes: The Creative Spark**
By Liane M. Gabora



138

The Great Firewall of China

At ISPs, Internet cafés, even state censorship committees, we meet the wired of China. We discover that the technology China needs to build the most powerful country on earth in the 21st century threatens to undermine the institutions that rule the nation. And Beijing's control freaks are worried.

By Geremie R. Barmé and Sang Ye

150

Hands off Hong Kong

By Louise Nameth

153 **Street Cred**

157 **Just Outta Beta**

165 **Net Surf**

184 **Nicholas Negroponte**

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Wired (ISSN 1059-1028) is a publication of Wired Ventures Inc.

Printed in the USA.

In Canada, International Mail Agreement #0501727

Registered for GST as Wired USA Ltd. GST # R134795954.

Submissions: Enclose a SASE for writers guidelines.

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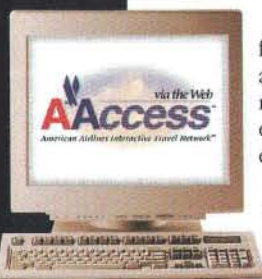


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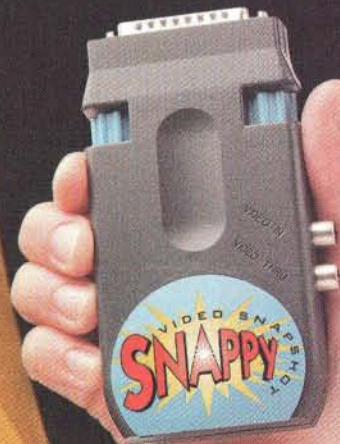
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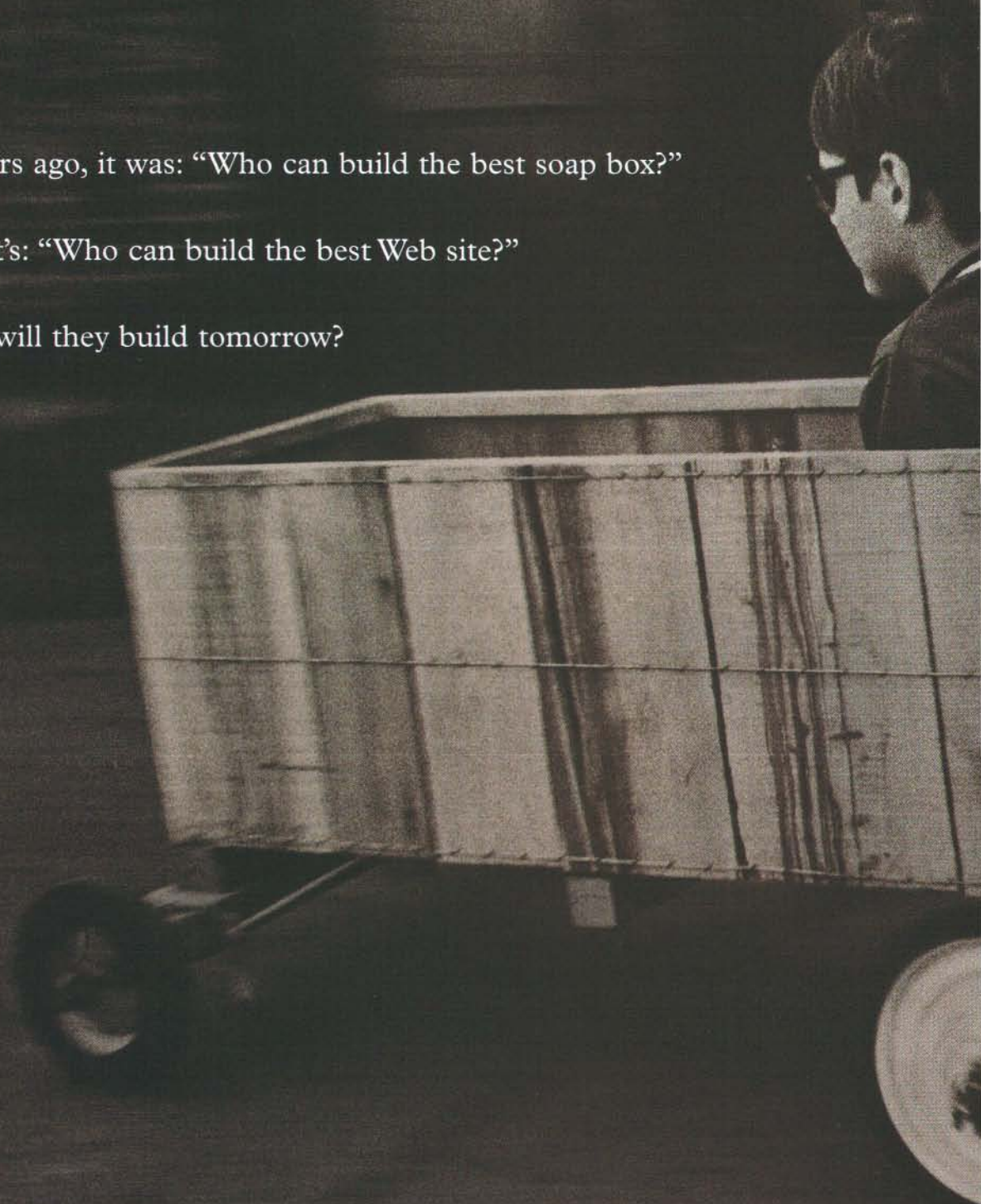
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SONY

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Push Overs

Although the advent of push/pull technology ("Push!" *Wired* 5.03) is exciting, I foresee one problem: content, or lack thereof.

I'm certain that technology can offer walls that are video screens, cigarettes that broadcast soft drink jingles, and toothbrushes that display stock prices. I am less certain of high tech media's ability to push anything interesting into my lap. The comparison to television exemplifies my point. I have access to so many channels but can't find anything interesting to watch.

The problem is that high tech companies will pay six-figure salaries to hundreds of software and hardware engineers but will spend only a fraction of that to hire writers, artists, and photographers.

Lucien Janik Jr.
turnip@jersey.net

Push applications make perfect sense in the many ways you described. But without multicast you are *showing* – not pushing – the traffic down the Net.

Push applications transmit content via unicast – each viewer receives a distinct datastream. As a result, the size of a sender's network pipe determines the number of receivers it can accommodate and sucks bandwidth from networks with multiple listeners. Since many receivers want the same data, these limitations and adverse affects are unnecessary.

A better technology would allow the sender to transmit a single datastream, which the network would distribute to receivers on request. That's exactly how multicast works.

Bob Quinn
rcq@sockets.com

Push media is a pox on the Web and must be eradicated at all costs!

The push model grabbed the attention of Internet publishers because it allows them to dispatch information without depending on users to visit their sites. Of course, you and I both know the *real* reason

these Internet publishers aren't getting visitors – their content sucks and people don't want what they have to offer. Publishers aren't willing to accept that low traffic might be *their* problem. So what do they do? These oh-so-thoughtful publishers force themselves on us and ram their worthless information right down our pipelines.

There are so many reasons why push media is wrong, wrong, wrong, but I'll focus on one: push media is old media! Internet publishers, who couldn't figure out how to work this crazy thing called the Web, have reverted to a tired (but manageable) publishing model. Push media is just mass media delivered to your desktop.



Remember when we first saw the Web, when we dreamed of a revolution in communication, media, and perhaps even human consciousness? Remember the many-to-many publishing model? Remember the democratic free flow of information? If we allow push media to become the status quo, we can kiss our Web dreams good-bye. We will lose the opportunity to revolutionize the way we connect. We will submit ourselves once again to the mind-controlling forces of massive media companies who tell us what they want us to know, not what we want to find out.

The Web is not a one-way medium!

Julie Petersen
chickjesus@awaken.org

I read (pulled, then pushed) with interest your cover story on push media and was shocked by one little paragraph on page 17. "Foremost is relief from boredom," it begins, and includes the fragment "the solitude of a country walk." It's hard enough to walk along a country road and not find a billboard (ambient push), a candy wrapper, or a soda can (both non-intentional push). To suggest that what we need on that country walk is pushed news broadcasts, pullable icons identifying tree species, and statistics on pedestrian accidents in Bumble County is a crock of roadkill.

As media (both push and pull) become more "ubiquitous," you're going to find me taking more walks in the "boring" country to get away from the millions

of voices that will apparently be storming my consciousness. I'll be leaving my PDA (pull) and maybe even my road map (ambient pull) behind.

Brian Hollenbeck
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A constant barrage of advertising already comes at me through my television, radio, telephone, browser, newspaper, and even my email box. Now you want it to follow me around everywhere I go? It sounds like a recipe for hell on earth.

The Web is a success because it provides information to users and doesn't pander to advertisers. Television is a vast wasteland

of useless predigested mush because the people running it put commercial interests before those of the viewers. If push media is going to follow the model of television, it's going to be a big waste of time.

Isaac Freeman
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Wired-Rimmed Glasses

It amuses me when people rant about digerati-biased articles in this publication. Do these same people write to Rush Limbaugh to complain about the conservative bent of his commentary? I read *Wired* cover to cover every month to get its unique perspective on current events, technology, and culture. It's a peek

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Scott C. Hill
schill@byteland.com

Sleazebag

I read the article on Steve Newman ("Would You Buy Brooklynbridge.com from This Man?" *Wired* 5.03, page 50) with unbridled revulsion. Newman epitomizes everything that the Net should *not* be. He'll sell you a domain name like maserati.net while assuming no responsibility whatsoever for copyright infringements — can you say "sleazebag"?

I have been using the Internet since it was the Arpanet, and I marvel as much as anyone at the technological and societal changes the technology has wrought. I also marvel at the carpetbaggers and snake-oil salespeople who have crawled out from under their electronic rocks.

So, Steve Newman wants to sell gratefuldead.org for US\$5,000? I'll do him one better: I just registered grateful-dead.org (a little more readable) and I'll give it to any Deadhead who wants to set up a Dead Web site for \$100 — exactly what I paid for it. fifth-avenue.org? wall-street.org? digital-times.com? I'll undercut Steve just for spite.

May the Steve Newmans of this world suffer bit rot and leave the Net to those of us who will benefit from it (and not just profit by it).

Dan Klein
dan@klein.com

Overrated and Inconsequential

The Telecommunications Reform Act is the most overrated and inconsequential law enacted by the 104th Congress ("The Great HDTV Swindle," *Wired* 5.02, page 57). Until I can purchase cable TV from the local phone company — GTE — here in Elkhart, Indiana, instead of the mediocre monopoly TCI, I will not be convinced that the 1996 act is anything but a populist ploy.

The FCC, Congress, the US Justice Department, and state governments should be using their bully pulpits to encourage the regional local-access telephone operating/exchange companies to compete against TCI for the lucrative right to purvey the passive cable TV signal. TCI has *not* proven that it can satisfactorily deliver cable TV, so how in cyberspace is the company going to handle the more difficult task of interactive fiber-optic Internet access? The superior technology of regional phone companies will soften America's transition from analog to digital HDTV by maintaining the dual-TV signal conveyance system that TCI is opposed to.

I see TCI as a more dangerous monopoly than Ma Bell ever was. The government should consider dividing up the listless cable conglomerate into seven firms, which could be bought at fire-sale prices by the

probable hybrid telecom firms of Nynex/Bell Atlantic/AT&T/Pacific Telesis/Southwestern Bell, et cetera.

Terry DeShone
Elkhart, Indiana

A Broadcast to India

Certain Indian officials might want to expel foreign broadcasting ("Caught in the Waves," *Wired* 5.03, page 54), but then again, certain US officials might want to ban the Internet. What matters is how these desires translate into policy.

I reported for *Wired* News that the Indian broadcasting laws currently under consideration try to restrict foreign ownership of companies broadcasting *from within India* — not satellite broadcasters such as STAR TV, which beams into India from Hong Kong. In the most recent draft legislation, the limit on foreign ownership is 49 percent for direct ownership and 74 percent for indirect — far more than the 25 percent permitted by US law.

In fact, this "restriction" will actually be a liberation. Currently, only the Indian government can broadcast (uplink) from within India. Now private companies will have that right, too.

Rishab Aiyer Ghosh
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Doomsayer Slayer

When I finished the article about Julian Simon and his one-man crusade to induce us all to put our heads in the sand ("The Doomsayer," *Wired* 5.02, page 136), I headed for some of Simon's primary sources. A half-hour of perusing the *Statistical Abstract of the United States* found no support for the claim that "from 1980 to 1990, known crude oil reserves increased by 50 percent." The Energy Information Administration's *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report* listed "known crude oil reserves" at 29.8 billions of barrels in 1980 and at 26.3 billions of barrels in 1990. Needless to say, I was surprised by this factual inconsistency in an article about "Mr. Data."

Regardless of the accuracy — or inaccuracy — of the facts Simon states, what is most compelling are the ones he fails to mention, such as the steady, documented rise in atmospheric carbon dioxide concentrations over the last 50 years.

Emma C. Farmer
McKinleyville, California

Nickeless Negroponte

I remain baffled by the relentless quest of Nicholas Negroponte and friends to attach microvalues to everything digital ("Pay Whom Per What When, Part II," *Wired* 5.03, page 220). In virtually every situation Negroponte described, it's not at all difficult to develop a payment scheme that doesn't require micropayments.

Why should I pay a nickel every time I reach for a piece of armor in a game? Why inflict that complexity on the system? Rather, let me pay for the game by the minute. Place a minimum charge on playing, if need be.

The Tyson-Holyfield fight was priced as it was because of a simple fact: the last Tyson fight — which cost US\$50 on pay-per-view — lasted less than one round. To the once-burned fans, pay-per-round made excellent sense and still does.

Bid-and-offer systems for things such as telephone calls, while interesting and valuable in many ways, also have no need for a new micropayment system. So why does Negroponte continue to tell us we need it?

W. D. Baseley
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NC: No Clue

I noticed two undereducated digs at the NC, or network computer, in the February issue ("NC: New Centralism?" *Wired* 5.02, page 123; Hype List, page 180). A misstatement in the first article — "Yanking expensive PCs and replacing them with cheap NCs will save companies a lot of money. But the cost of innovation will be high" — misses a major point. The NC is not meant to replace the PC! It's an Internet device. The NC provides Net access to those unable to maintain and configure the ever-complicated desktop PC.

PCs are powerful devices with one major function: to create and edit digital information. A PC is like a television studio: a factory for creating content. Why should a consumer of digital information be required to buy a PC? That would be like requiring TV viewers to purchase a television studio.

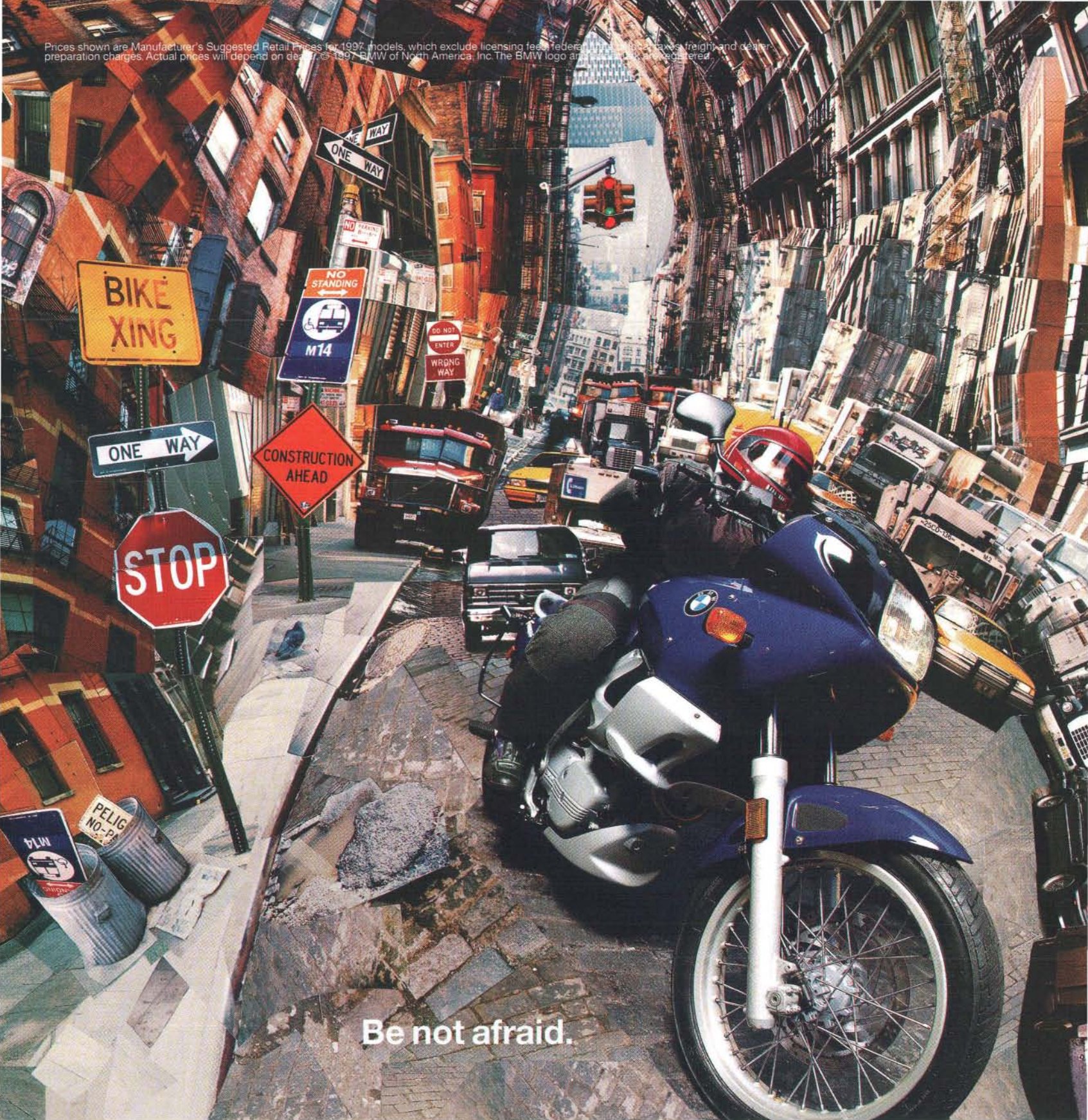
PCs have not found a stronghold in public schools, libraries, and other poorly funded public institutions because they are too complex and the knowledge needed to keep them running is too expensive. What is needed is a simple device with an intuitive user interface that allows people access to the information they want, without the hassle of having to know the inner workings of the technology. The NC is more than a burned-out buzzword or a dumb terminal. It is a simple solution to a complex problem: bringing networked information to the masses.

Michael Eichler
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Fact and Fiction

It had been a long time since a piece of journalism absorbed me as much as Po Bronson's "Building the VW of PCs" (*Wired* 5.03, page 156). I was astonished by Bronson's clarity as he perceived the motivations of the engineers at La Honda. "Man, he must have done his homework to get such a handle on the dynamics of the group," I remember thinking. And wow! What a great saga. Who wouldn't be enthralled

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The Ultimate
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by a group of quirky engineers running amok at a backwoods oasis of creativity?

It wasn't until I went to the Web site to scare up Bronson's email address that I realized — oh! — it's fiction. Too bad: as an article, this story was darn close to inspirational.

Aaron VanderWal

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Warez Wary

The estimate of the dollars lost from software pirates given in "Warez Wars" (*Wired* 5.04, page 132) is over-inflated. US\$291.5 million a week? Prove it.

At a recent lecture I attended, some software industry guru held up a CD-ROM and claimed that it could be purchased in China for about \$20 but had well over \$20,000 worth of programs on it. He then claimed that billions of dollars per year were lost due to piracy. Whoaaa. After the lecture, I asked whether in calculating this billion-dollar number, the organization counted the evil disk as \$20 or \$20,000 in lost profits. It had used the bigger number, arguing that consumers *might* have actually spent the 20 grand. What?!

When Michael, the "warez junkie," downloads \$50,000 worth of software, the industry is not losing \$50,000 in real money. Would he have spent \$50,000 on the legal software? If the answer is no — and I bet it is — then the software industry hasn't lost a penny.

Frank Golding

fgolding@richoneil.com

In setting up the warez issue as a battle between the anarchistic, profit-motiveless pirates and the stuffy, horrified-by-the-(probably exaggerated)-profit-loss software developers, the article missed a key point. Who really loses from the proliferation of warez?

As a legitimate user of NewTek's LightWave 3D, I'm paying considerably more for this software than I would otherwise have to, because of the amount of time and energy that NewTek has to devote to copy-protecting its software, not to mention the additional profit it builds in to cover the losses it will incur from piracy. As in any war, it's the innocent bystanders who usually suffer the most.

John Prusinski

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I usually enjoy your magazine and its cutting-edge material, but this time you went too far. *Wired* has a reputation for being not so smart when it comes to the Internet and computing underground, but the warez piece was the worst. How could you write an article on software pirating without explaining exactly how the warez scene works?

Separate groups specialize in "releasing" games and applications. People known as "couriers" spread the files to FTP sites and BBSes. Releasers often have jobs

at software companies and can get ahold of new titles early on. The names of the cracker, the releaser, and the uploader are listed on every program. Some people will do anything to get an early release and will put out betas or incomplete programs.

Once the program is cracked and uploaded, the courier groups do their thing. These groups are assigned to specific BBSes and FTPs. The courier that pumps out the most megs is allowed on more BBSes. A good courier must move files everywhere — fast. To do this, some couriers have two nodes or modems uploading and downloading at the same time. Net couriers deal with spreading megs on the Internet; others spread warez through IRC. A pirate in China simply downloads a pirated version and copies it onto some two-way CDs. It is easy. It also does not take much skill to be a courier. All you need to know is how to completely waste your life for the purpose of fame and recognition.

"Lucky Luciano"

Los Gatos, California

Credit Due

As a creative director in the kids' entertainment business and a producer of online entertainment, I am always excited to see more content devoted to girls ("Girl Games," *Wired* 5.04, page 98), who have been underserved in the CD-ROM world. As the article mentioned, *Chop Suey* broke the mold.

However, I noticed a blooper in G. Beato's story. *Chop Suey* was the collaborative work of two women: Theresa Duncan and Monica Gesue. Not only did Gesue conceive, illustrate, and art-direct the CD-ROM project, some of the more memorable writing was hers as well. Heck, Cortland, Ohio — where the story is set — is Gesue's hometown. In the spirit of professionalism (and good manners), you should give credit where credit is due.

David Vogler

davidv3249@aol.com

Digital Nations

Jon Katz's excellent "Birth of a Digital Nation" (*Wired* 5.04, page 49) was marred only by its ethnocentricity. It is incumbent upon the digerati to be aware that the online world is not American. The politics and morals of the Net are being forged everywhere. In areas such as export cryptography and censorship, US policy designed to "regulate" cyberspace is already floundering. Slowly and inexorably, control of such matters is moving into the Digital Nation; a nation that is not and will not be bounded by geographical borders.

Peter Miller

ocean@mpx.com.au

Let's Get Physical

Have the laws of physics changed recently? When I was in high school, sound waves were carried by

compressions and rarefactions of air ("Get Wireless," *Wired* 5.04, page 142). Electromagnetic waves were a completely different phenomenon, needing no transmission medium whatsoever. Sounds and electromagnetic signals were both described as waves, because they each exhibited wavelike characteristics, but they were very different things. Calling radio waves and other electromagnetic waves "airwaves" was just a metaphor.

Um, did this change? Your map of the electromagnetic spectrum seemed to include sound waves, which is like including snail mail in a list of modems: they're not the same thing.

Barrett Sundberg

action8r@io.com

The Internet Revolution?

I read "The Internet Revolution" (*Wired* 5.04, page 122) with growing disbelief. It is a remarkable achievement to write about a budding political revolution for 12 pages without actually discussing the politics of the movement. David Bennahum mentions democracy a few times and says something about antinationalism, but by and large he gives a warm and fuzzy reading about something not only unlikely but improbable. By his own account, these people are apolitical and their influence nil.

The idea of the Web playing a role in a revolution is exciting, but applying it to this particular situation is far-fetched. I have received some of the emails from Belgrade he refers to, but I could not help thinking of the real, brutal massacre of hundreds of thousands of people — on both sides, but mainly perpetrated by the Serbs — and justified intellectually by the same Serbian intellectuals and clergy who call themselves "democrats."

I charge Bennahum with incredible naïveté, ignorance, and lack of journalistic curiosity for the truth. It might have been an extremely titillating adolescent experience to be brushed by history, but both ignoring political reality and trying to bend reality to his partisan agenda is reprehensible.

Tamas Banovich

manyone@hotmail.com

Undo

■ Photo Finish: The negative/positive photographic process was announced in 1839 ("The Future of Photography," *Wired* 5.03, page 90), the same year the daguerreotype was introduced. ■ Typos 'R' Us: Eric Michael Strauss's correct email address is eric.strauss@internetmci.com (Rants & Raves, *Wired* 5.03, page 44).

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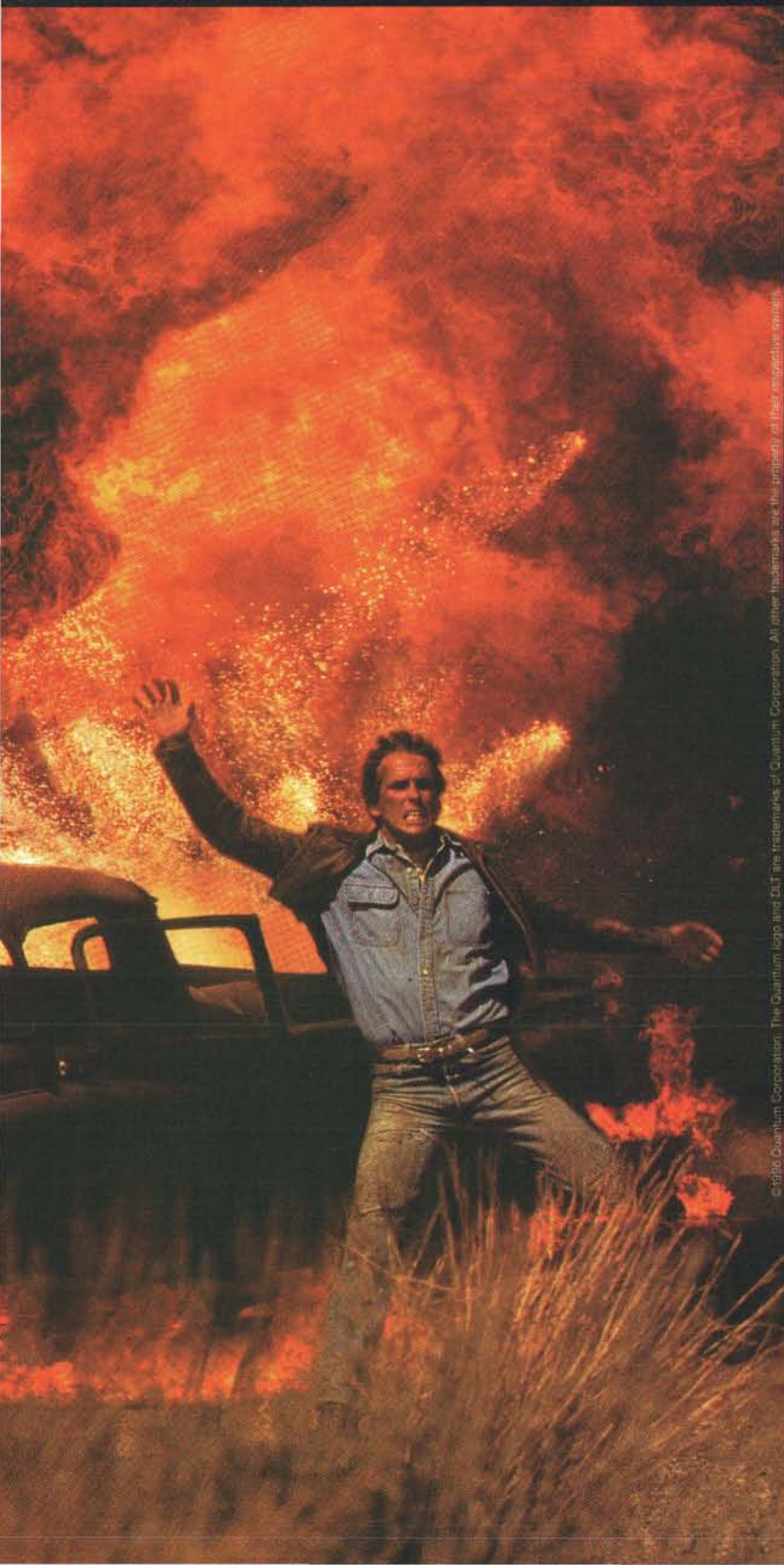
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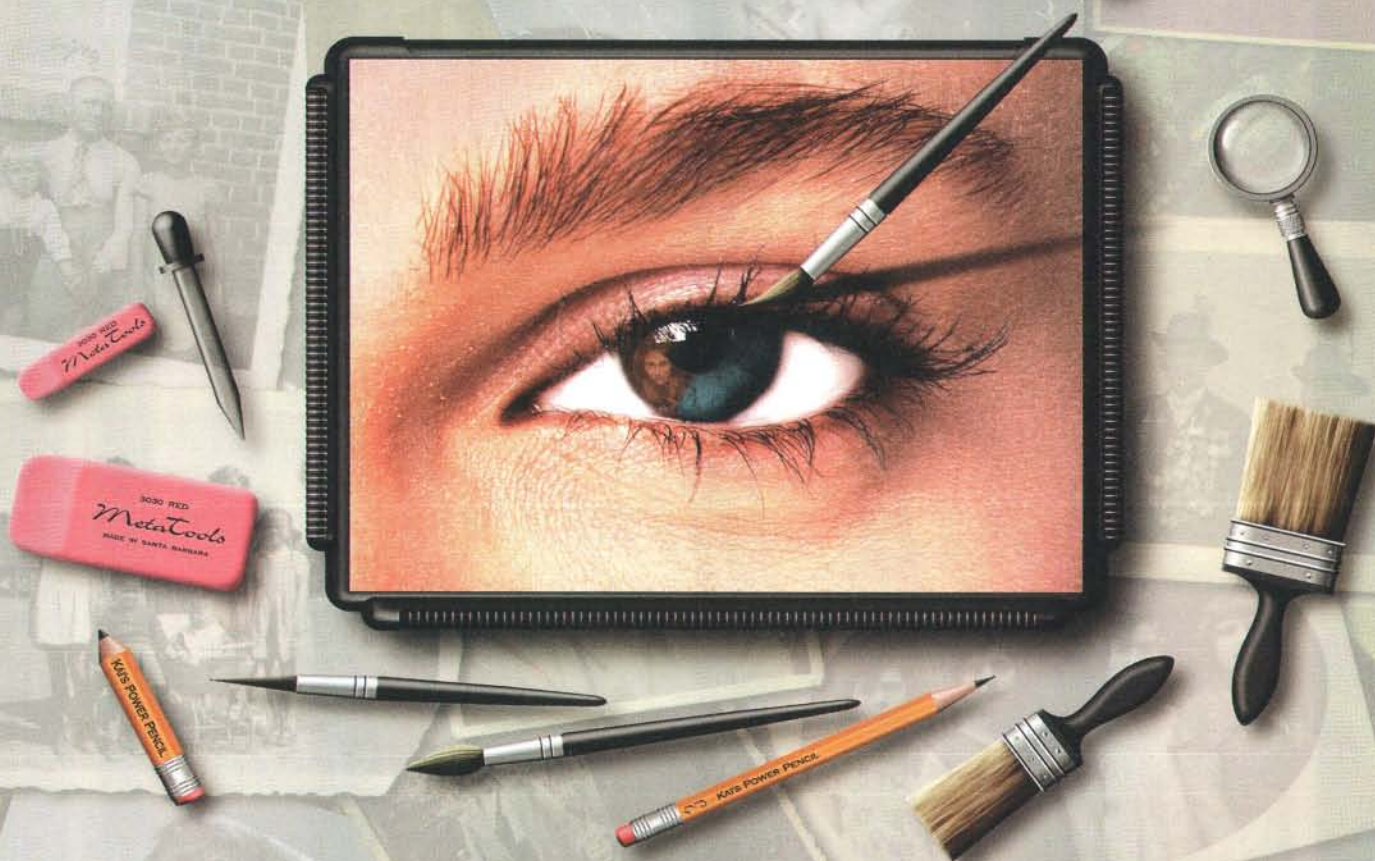
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Must-See PC TV

It was no mistake that the recent National Association of Broadcasters convention attracted a sizable contingent from Silicon Valley and Redmond. As the biggest television stations ready themselves to go digital in late 1998, many could choose a video format incompatible with computer displays. So Bill Gates & Co. have stepped in to push their digital TV concept to market first – all in a frantic effort to win broadcasters over.

Subtlety has never been Chairman Bill's hallmark. Microsoft chose the eve of the convention to swallow up Internet set-top box manufacturer WebTV for US\$425 million. Then, as if that weren't enough to get the attention of television execs, Microsoft, Intel, and Compaq announced an enhanced data-layering standard for PC-friendly digital TV. Add to this IBM's announced digital broadcasting system, Logicast, and you have ingredients for the best high tech race since VHS faced off against Beta.

If all goes as planned, the computer industry's version of digital TV will go online by the third quarter of 1998. This time, the superior technology may win. – *Michael Grebb*



E L E C T R I C W O R D

Black Eyes for Bill

In the latest rounds of the encryption battle royal, the Clinton administration's key escrow proposals have taken a beating – yet again.

In March, the Organization for Economic Cooperation and Development released its "Guidelines for Cryptography Policy," a document outlining principles that will guide much of the industrial world. The OECD rejected the US approach, choosing instead to leave key escrow implementations to member nations.

Meanwhile, back at home, the Clinton administration was caught flat-footed circulating draft legislation that would have the practical effect of compelling crypto users within the US to participate in a government-dominated key escrow scheme. A copy of the proposed law, euphemistically called the Electronic Data Security Act of 1997, was passed on to privacy advocates by sympathetic congressional staffers.

"The White House got caught with its pants down," says Jonah Seiger of the Center for Democracy and Technology. "The administration wants the Net to be built to its specifications, but that idea just isn't going to fly."

With opposition mounting, just a few more jabs could put key escrow down for the count. – *Todd Lappin*

Digital Face Lift

Using technology to artificially age an image – of a criminal, a missing child, or an actor – is nothing new. But Industrial Light & Magic faced a distinct challenge when Veuve Clicquot, the great champagne house, made a related request. A woman of the 19th century, Veuve founder Nicole Clicquot Ponsardin left behind only two images, both portraits made while the grande dame was in her 70s. But the company wanted a picture of Clicquot at 27, when her husband died and she took over, transforming their champagne business. Susan Davis, manager of ILM's art department, told Veuve Clicquot, "If you want a scientific regression, we're not the ones. But we can get you close in a creative sense through research." So ILM found two teenagers with facial features and ethnic backgrounds similar to the widow's and, using Macs, morphed portions of 20 photos of one model and five of the other with the original painting. The results can be seen at www.clicquot.com/. – Chris Rubin



≡III Online Journalists Need Not Apply: Gut-wrenching public interest journalism, knee-scraping investigative reporting, insightful editorials – these are the makings of a Pulitzer Prize. Oh, and did we mention that the distinguished works must be on paper? This year, two nominations were disqualified

because they failed to fulfill the prize's print requirement: *Bosnia: Uncertain Paths to Peace*, a *New York Times* Net series on CD-ROM, and "Our Town Charlotte," an online presentation by the *Sun Herald* of Charlotte Harbor, Florida. The award's administrators are reevaluating the analog-only policy, but in the meantime, prize-eyed electronic reporters can only dream on.

≡III No Class: A study recently conducted by the Market Data Retrieval organization concludes that classroom use of the Internet in grades 3 through 12 has not improved scholastic performance. The surveys were given to 6,000 ▶

The Race for Space

Low-Earth-orbit satellites seem to be popping up everywhere. Craig McCaw and Bill Gates's joint venture, Teledisc, recently received FCC approval to launch its digital communications project by 2000,

and Motorola's Iridium has announced that it will ramp up its services to allow for cellular-system roaming.

Why are LEO satellites suddenly so hot? Equipped with omnidirectional antennas, these satellites will improve

everything wireless: fax, paging, phone, and teleworking services. Due to the greater silicon densities achieved over the last 20 years, capacity has gone up, while price has gone down. LEO satellites, orbiting a mere 500 to

1,000 miles above the earth, use less power than their older, bulkier counterparts and boast no transmission delays.

Lost track of who's launching what, and when? See below. – Julie Sullivan

Who	How many	Launch date	Service date	What
Teledesic	840	2000	2002	Global broadband service including videoconferencing and multimedia
Iridium	66	May 1997-April 1998	September 1998	Worldwide voice, data, fax service
Alcatel Alsthom	64	2001	2001	high-quality videoconferencing, teleworking, and entertainment
Globalstar	56 (48 operating; 8 spares)	August 1997	End of 1998	Voice, low-rate data exchange, some messaging, fax
Leo One	48	Pending	2000	Email, paging, messaging, fax
Orbcomm Global	36 (28 in orbit; 8 spares)	April 1995-March 1998	March 1998	Email, paging, messaging, fax
ICO Global	12	September 1998	2000	Voice, data, Internet communications
Odyssey	12	2000	2001	Mobile voice and data, phone service to remote regions
Orbimage	3	Present to end of 1997	1997	Weather services, high-resolution digital photography



Crypto Lite

Originally used by space-age bachelors to illuminate their pads, Lava Lite lamps have been a perennial favorite of kitsch aficionados. But of the millions of lights sold since 1963, six have been assigned to a higher purpose – cryptography.

Silicon Graphics Inc. number

theorist Landon Curt Noll, along with colleagues Robert Mende Jr. and Sanjeev Sisodiya, is employing the liquid-filled lamps to help generate random numbers used in cryptography.

Here's how the Lavarand system works: A digital camera snaps a photo of six Lava Lites. A cryp-

tographic hash formula is then used to reduce the photo data into a seed number. This seed is plugged into a "Blum Blum Shub" pseudorandom algorithm and presto! – out comes a cryptographically strong number. "It sounds far out," Noll admits, "but using Lava Lites to obtain

random numbers is based on fundamental math and physics."

The scientists have applied for a patent; in addition to using the system at Silicon Graphics, the trio hopes to license the technology. "We have several interested parties," Noll beams. – Mark Frauenfelder

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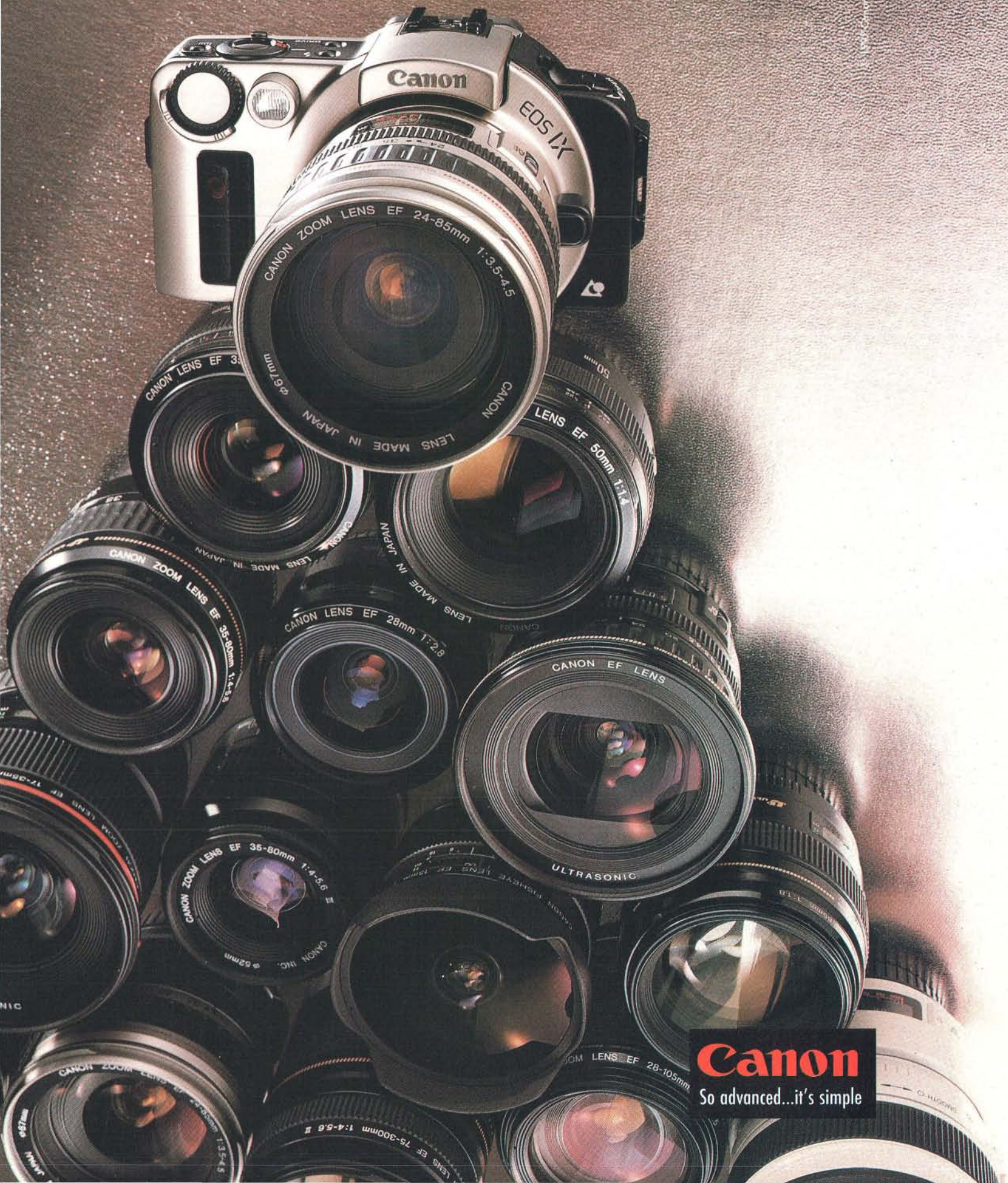
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Move over, GPS. British astronomer Peter Duffett-Smith has invented a technology that can pinpoint a digital cellular phone's location within a few hundred feet. The system, called Cursor, tracks a handset by radio triangulation – a method similar to the use of radio telescopes to chart distant galaxies.

Using a ping-and-reply system, a transmitter network relays the handset's location on the same 900-MHz phone frequencies. When the technology becomes commercially available in 1998, marketer Cambridge Positioning Systems envisions GPS-like uses such as regional mapping and enhanced 911 tracking.

Privacy advocates have another take on it. "This is likely to be used by law enforcement to trace signals," says Marc Rotenberg, director of the Electronic Privacy Information Center. Under current law, telcos don't reveal call locations. But the FBI is petitioning to change this. "In the old days," notes Rotenberg, "the phone didn't move." – David J. Wallace

► teachers and librarians – no one asked the kids what they got out of it. If anything, this argues for a change in the way we teach our kids – starting with teachers and the definition of

"classroom performance." ■■ Sign of the Times: America Online and its diskette packaging supplier are unhappy with each other. Apparently PTP Industries claims that AOL owes it more than US\$2 million, based on the 150 million irritating trial diskettes PTP claims to have distributed. AOL rebuts that PTP is overestimating the number of disks. Let's see – a bit of back-of-the-envelope math should resolve this: About 20 percent of adult Americans – around 21 million – are now online. Another 17 million or so have computers but so far have resisted AOL's marketing come-ons. A little quick division yields only about four ►

Maybe it's just the Tinseltown hangover brought on by its 1996 Oscar for technical achievement, but IMAX has gone Hollywood – big time. The Toronto-based company, whose large-screen, 3-D explorations have long been staples of the science-museum crowd, plans to jack up its mass-market appeal with more short fictional films and a worldwide rollout of new motion-simulator rides.

Last year, IMAX introduced *Wings of Courage*, a 45-minute 3-D aviation adventure from Sony Pictures Classics starring Val Kilmer. Preliminary talks are

now under way to bring a *Toy Story*-type film to multistory screens, says IMAX chair Brad Wechsler. And come December, Vegas thrill seekers can board *Race for Atlantis* for a digitally animated chariot ride.

Over the next few years, IMAX will add 45 new theaters to the 149 sites already spread across the globe. The public can't seem to eat it up fast enough. Some 65 million people saw IMAX movies last year, quadrupling the company's annual earnings to US\$15.4 million. For IMAX shareholders, that's entertainment. – James Daly



PHOTO ABOVE: DOMINIK GIGLER



TIRED

Communist coups

Medellín cartel

Barbie Fashion Designer

Mac v. PC conversations

Agents

Electronica

Billboard liberation

SPF 15

Java

Digital certificates

Erbium-doped silica fiber

Abdusters

Highlights



WIRED

Ponzi schemes

Russian aluminum mafia

Pretty Fighter X

NT v. Win 95 conversations

Negative agents

Skrunk

Guerrilla gardening

SPF 50-plus

Cobol

Handshakes

Erbium-doped fluoride fiber

®™ mark

MamaMedia

Austria Turns Off

Sometimes silence is the most effective form of protest. The latest round of the German government's war against the Internet has crept across national borders, provoking an unprecedented response from neighboring ISPs: total shutdown. The two-hour strike this spring, during which 98 percent of Austria went dark, was set off by a national police raid on a small Austrian ISP called ViP. The cops, looking for child pornography, confiscated ViP's computers – based on charges filed in Munich against a ViP user. Nothing was found.



This action is only the latest attempt to impose German law on the global Internet. Even though Deutschland knows it can't police the entire Net, the country is banding together with sympathetic European governments to strong-arm users into complying with Germany's laws. This has many ISPs living in fear. But netizens are fighting back. Earlier this year, German state prosecutors trying to close a Dutch ISP hosting a militant left-wing magazine were forced to back down in the face of an uproar from the international Net community. – Hari Kunzru

► useless diskettes per computer-literate American. Hmmm. Cough it up, AOL. ☺ Tokyo Online: The Japanese international telecommunications firm KDD reports that Internet traffic between the United States and Japan flows at more than twice the rate of voice traffic, and half of voice traffic is not really voice at all, but fax. ☺ Spam Hater: The fistfight between spammers and bozo filters shows no signs of easing. Steve Harris, creator of the Spam Hater freeware, has been proclaimed an "Internet folk hero" by Usenet denizens fed up with unsolicited commercial email. Harris, a computer consultant based in the United Kingdom, made Spam Hater (www.compulink.co.uk) ►

Shock Jocks

Fresh from the late-night television circuit in Japan and a European tour, The Tokyo Shock Boys are hitting the Big Apple. At the off-Broadway Minetta Lane Theatre, the four kamikaze comics drop fireworks down their pants, spit milk from their eyes, and swallow scorpions and cigarettes.

Geeks of global proportions, the troupe sold out the Sydney Opera House and a venue in London's West End and even gave a command performance for the queen of Denmark.

Shock Boy Nambu performs one trick audience members few will try at home. Tethered to a chair by his testicles, the showman tows volunteers across the stage. Carol Channing would be hard-pressed to top that. – Ian Christie



PHOTO BELOW: PATRICIA EICHWALDER. PHOTO ABOVE: IMAGE BANK

Battle Smarts

When is one US Marine better than three? When he has an Apple Newton squirreled away in his foxhole. At least that's what the military says it learned last March when roughly one-third of the marines in a unit of 1,500 were sent into simulated combat with a land-mobile radio and a handheld computer.

Their opponents – a conventional force of 4,500 marines armed with traditional radios – found themselves dogged at every turn by the tech-toting unit.

"The idea was to marry technologies with new organizational strategies," says Commander Ron Henderson, a US Navy officer who participated in operation Hunter Warrior. According to Henderson, the wired warriors, whose leaders had access to artificial-intelligence strategy advice and virtual reality helmets allowing them to track their troops, "fought" well against their massed, heavily armed foes. "Only one high tech outfit was destroyed – virtually, of course."
– Ashley Craddock

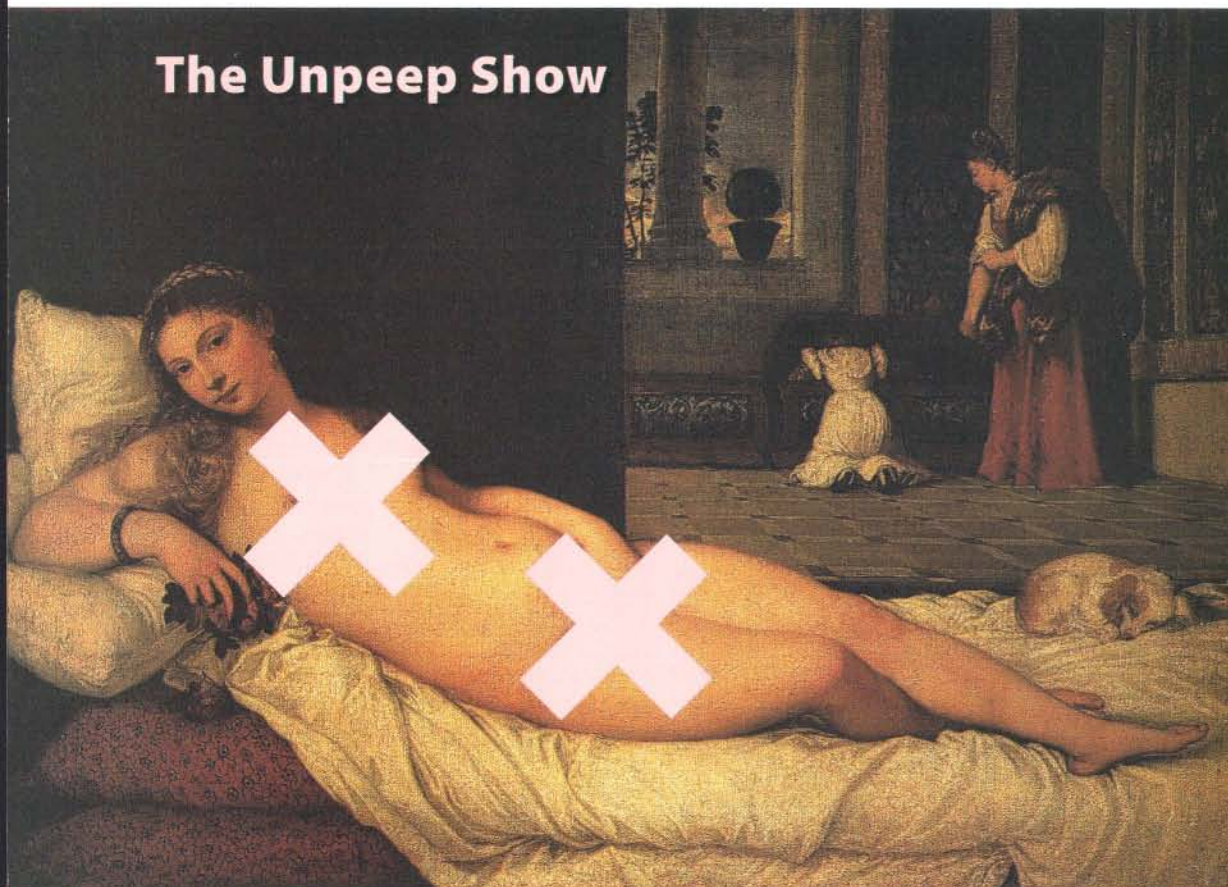


► /~net-services/spam/) available to the public in November and recently released a new version

that identifies a spammer's upstream ISP. After Spam Hater digs up the perpetrator's and ISP's email addresses, the antispammer can send both parties messages such as "Your punishment is to break up your modem with a hammer and eat it." This approach gets results: many ISPs have canceled spammer's accounts after being spammed themselves by Spam Hater's replies. ■■■ HAL's First Words: At the University of Illinois's recent birthday bash for 2001: *A Space Odyssey's* HAL, guest of honor Arthur C. Clarke (via cybercast from his home in Sri Lanka) judged a contest to suggest what the world-famous computer's first words would be today. The winning entry: "Good evening, doctors. I have taken the liberty of removing

Windows 95 and all references to it from my hard drive." ■■■

The Unpeep Show



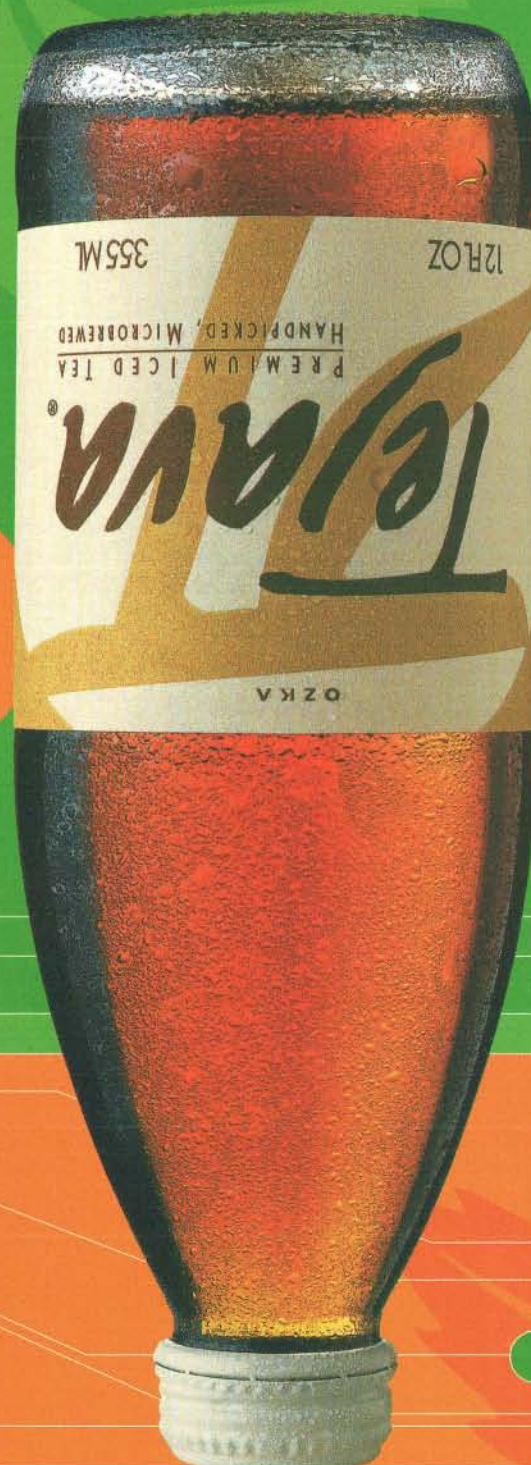
Minors can now enjoy squeaky-clean computing, thanks to ImageCensor. Billed as "antipornography software for Windows," it stops smut cold on computers running the Microsoft OS.

Unlike URL-based filtering software such as Net Nanny, ImageCensor blocks dirty pictures from being displayed, regardless of their format or source – online, local disk, or CD-ROM.

The product employs an image-detecting algorithm developed by scanning and color-testing thousands of nude photographs. "The algorithm analyzes the color in an image to determine its wholesomeness," claims Philip Harris, director of Microtrope, a developer based in the United Kingdom. "We then apply other filters to make it more accurate."

Asked whether a classic such as Titian's *Venus of Urbino* would be blocked, Harris says that it probably wouldn't. As for other works of art or science, "we haven't come across any," he says sheepishly.
– Michael Stutz

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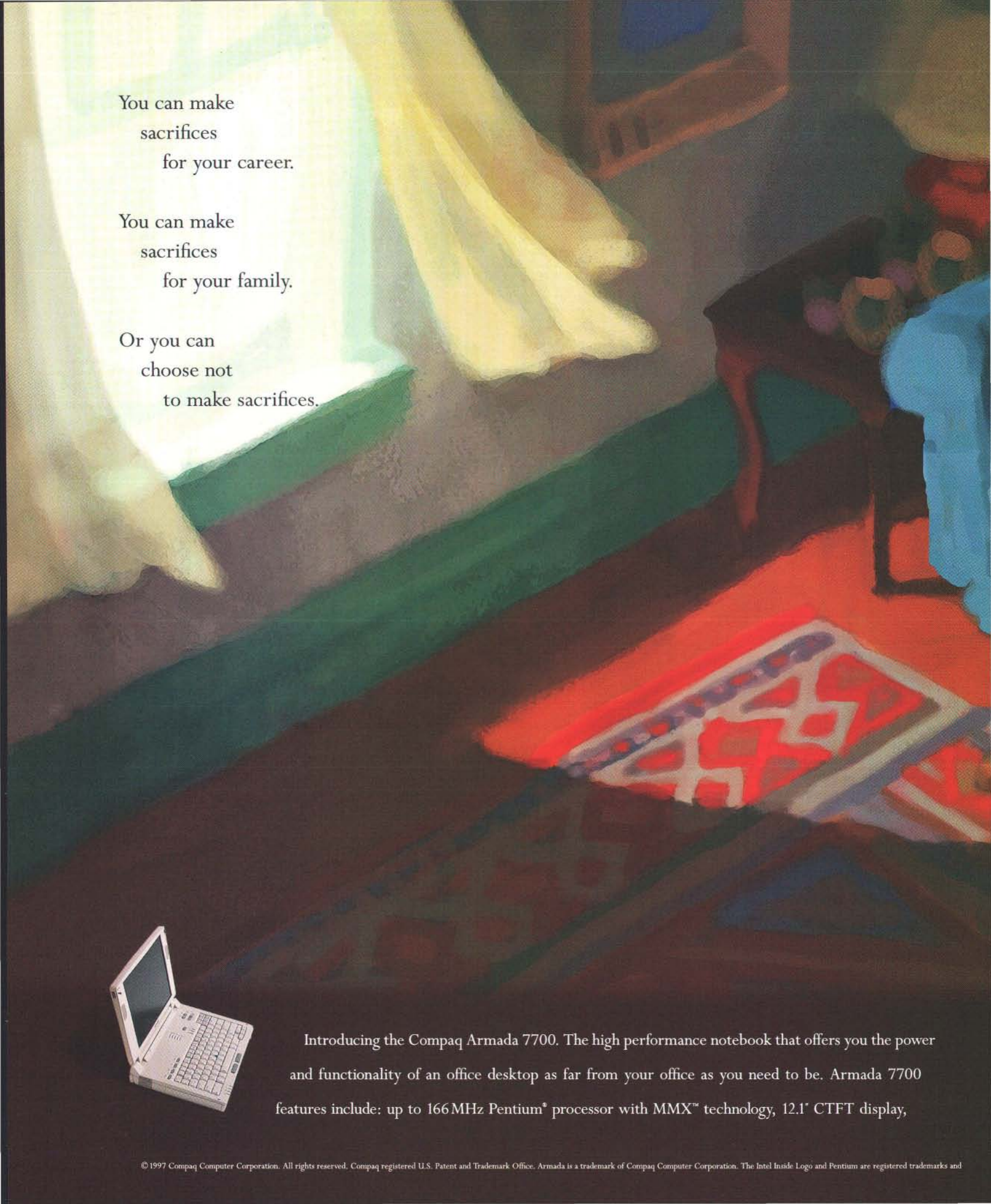


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An impressionistic painting of a room. On the left, a window with yellow curtains lets in bright light. In the center, a dark wooden table holds several colorful, round objects. A large, patterned rug in shades of red, orange, and blue covers the floor. The overall style is soft and painterly.

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Telco Terrorism

**If the Baby Bells get their way, you'll pay by the minute
and through the nose for the privilege of logging on.
But the Net has an unlikely defender: the FCC.**

By Declan McCullagh

www.wired.com/5.06/netizen/

Ed Young, Bell Atlantic's chief lobbyist, is a busy man – so busy, he says, that he can find time to talk only between meetings in a Nynex boardroom in Washington, DC. He waves expansively at the juice bar and grins, "Take whatever you like. It's all paid for by Nynex." A moment later, Young denounces Internet users for precisely the same attitude. "There's no longer a free lunch," he complains. "Internet welfare has to stop." It's a catchy sound bite – honed through countless repetitions over the last year – and Young has spent a lot of time testing it out on Washington regulators. He says that flat-rate Internet pricing is clogging phone lines, jamming telephone switches, and, most important, costing his employer hundreds of millions of dollars a year. Last summer, Bell Atlantic teamed up with a few other Baby Bells to try to persuade the Federal Communications Commission to

levy minute-by-minute access charges on Internet service providers – hefty fees that could double or triple the average monthly bill. For the telcos, securing permission to begin collecting access fees would be like hitting the jackpot; a charge of merely 3 cents a minute would bring in nearly US\$6 billion in new revenue each year.

But some important members of the high tech community worry that it could also trigger the death of the Net. Three-cents-a-minute access fees would boost a service provider's costs by more than \$100 a month for each subscriber who logs on for two hours a day. In an era when \$19.95-per-month flat-rate pricing reigns supreme, the thought of shelling out per-minute access charges to local phone companies has the online industry scared shitless. CompuServe, for example, estimates that its phone costs would zoom from \$36 million to \$367 million. The online and high tech industries have counterattacked, arguing that while more than 18 million Americans creep through cyberspace using modems that sip bandwidth through twisted-pair straws, the telcos want more money yet refuse to improve service by bringing high-speed data connections to the local loop. ►

Declan McCullagh (declan@well.com) is Washington correspondent for The Netly News (netlynews.com/).

The stage has been set for a showdown between a telephone industry regulated since its birth and a new economy that has prospered with surprisingly little government interference. The tug-of-war pits buttoned-down monopolies against a rough-and-tumble collection of Silicon Valley bigwigs. Faced with potential disaster, the high tech coalition has had no choice but to learn the art of war as it is waged within the confines of the FCC's arcane rulemaking process.

This strange form of bureaucratized combat – which operates under the guise of public policy – has plenty of precedents in the annals of American capitalism. But in this particular fight, an unusual third set of

combatants has been dragged into the struggle: grassroots Internet users. Speaking with a mixture of awe and bewilderment, FCC attorney James Casserly says, "In the past, we've never seen anything like this."

A case of congestion

It's not that the telcos' anxieties are entirely unfounded: real problems loom on the horizon. America's local-loop architecture – in which modems use analog phone lines for digital communications – is vulnerable to network congestion, and flat-rate pricing for

phone and Internet service seems destined to exacerbate the problem. This is largely because telephone networks are designed around the assumption that roughly one in every eight subscribers will try to use the phone simultaneously – which, in turn, means that if just 12 percent of an area's customers are online at once, nobody else can use the phone. In other words, America's telecommunications infrastructure, was designed to facilitate occasional analog calls, not continuous digital connections. The telcos are standing at a crossroads, stuck with a network that was designed for voice traffic but that now groans under the weight of data calls. The Baby Bells understand this, and they say they want to go digital. Which raises the questions: How will they do it, when will they do it, and, more important, who will pay?

Both sides agree that the solution lies in new technology. Currently, most phone calls travel along an analog phone line to a digital switch that connects to an analog outgoing line. Find a way to bypass the analog connections with end-to-end digital networks, and the congestion problem disappears. Here's why: To transmit data, analog circuit-switched networks require a continuous open channel, which must be maintained even when it's not in use. But a digital packet-switched network, such as the Internet, breaks

the data into small chunks that are sent as needed asynchronously and reassembled by the receiver.

Right now, the telcos have no financial incentive to promote speedier, more efficient technologies – and when they've tried, they've blown it through a combination of high prices and notoriously bad customer service and support. Take ISDN, a digital technology that has been ready-to-arrive for 25 years but never quite did. "The problem isn't technology," according to James Love, an economist at the Ralph Nader-sponsored Consumer Project on Technology. "It's monopoly pricing by the telcos."

There are even better technical solutions than ISDN, such as xDSL, about which the telcos appear ambivalent at best. They shouldn't be. The xDSL family of digital-subscriber-line technologies could provide a way out of the regulatory staredown between the telcos and the Net, supercharging ordinary copper wires to carry data at Ethernet speeds without clogging the voice network.

Studying the studies

For now, however, both sides are pumping most of their energy into spinning the argument. Last June and July, Bell Atlantic, U S West, PacBell, and Nynex launched the opening salvo in the access-fee battle by passing along a few studies to the FCC. The Bell Atlantic report noted that Net surfers use their phone lines to make longer calls, with an average length of 18 minutes, compared with 5 minutes for a typical voice call. Meanwhile, Bell Atlantic said it spends \$75 to service and maintain each local loop that runs into an ISP line – lines that generate revenues of only \$17 per month. That piddling 17 bucks, the telcos claim, barely covers the cost of keeping a dial tone humming, and isn't nearly enough to pay for the expensive upgrades needed to handle circuit-gobbling Internet providers. If more money isn't spent to upgrade the network, the scaremongers warn, traffic jams caused by gluttonous Internauts could become a public menace. The report concluded that "service interruptions of even a temporary length could affect public safety services such as 911 service, with unthinkable consequences." The telcos' solution: the FCC must let them levy per-minute access charges to raise the hundreds of millions of dollars a year needed to keep the phone system from crashing.

To battle the phone companies' analytical onslaught, Intel, Compaq, IBM, America Online, CompuServe, and a handful of trade associations formed the Internet Access Coalition in the autumn of 1996 to craft a counterstudy to rebut the telcos' claims. Delivered to the FCC in January 1997, the coalition report, titled "The Effect of Internet Use on the Nation's Telephone Network," blasted telco assumptions and pointed out their hypocrisy: the Baby Bells whine that flat-rate ▶

In the showdown over access charges, the high tech community has been forced to learn the art of war as it is waged within the confines of the FCC's rulemaking process.



Internet services are congesting phone lines even as many of them are peddling flat-rate Internet access themselves. Some have actually given it away – in California, PacBell offered five months of free Internet service and waived installation charges for customers who ordered a second phone line. How can a cash-strapped phone company afford this? Since many homes are already wired for two lines, second-line service has become a source of easy profits for the telcos. In 1995, for example, second lines generated six times the revenues the Baby Bells now say they need to upgrade their networks.

**All this wonk warfare
might have gone
largely unnoticed on
Main Street USA, were
it not for an FCC Web
page that solicited
public input on the
access-charge issue.**

The coalition's debunking was thorough. Even if data calls average 20 minutes – so what? One such call eats up fewer phone company resources than 20 individual one-minute voice calls. Moreover, the much-publicized “clogged network” numbers came from areas with exceptionally heavy modem use – regions that are hardly representative of the network as a whole. In other words, the telcos gave the FCC anecdotal, worst-case estimates of network-congestion difficulties and presented them as commonplace, or perhaps even dangerous. The phone companies reacted to the IAC study by retreating from their initial position. No longer will you hear their lobbyists talk of 3-cents-a-minute access surcharges; since early this year the fallback stance has been to seek some charge – any charge! – as long as it's collected through a metered pricing scheme. “It doesn't have to be a large charge,” Bell Atlantic's Ed Young now says. “It can be something of the magnitude of a penny a minute, or even less. But it has to be something.”

The friendly FCC?

The Baby Bells might have assumed they had allies in the four FCC commissioners. The agency's history is replete with precedents in which decisions have shielded venerable industries from competition by upstarts. The commission delayed the introduction of FM radio to protect AM stations. It stalled cable television to benefit broadcasters. No wonder, then, that many Internet users took for granted that it would happily sacrifice the Net to spare the telcos.

But, surprisingly, the FCC has often gone out of its way to protect the Net from telco onslaughts. A 1980 directive dubbed “Computer II” said the commission would regulate only “basic” telephone services, not providers of “enhanced services.” That marked the Net's first reprieve, as the “enhanced service provider”

category includes everything from voicemail services to alarm-monitoring firms to Internet providers.

In 1984 Ma Bell splintered, and the FCC decided to tack an “access charge” of roughly 5 cents a minute onto every long distance call to compensate local phone companies for completing the local-loop connection. The Net's second reprieve came when commissioners ruled that enhanced service providers wouldn't be obliged to pay similar access charges because of the “severe rate impacts” that would result.

Finally, in 1987, the telcos trotted out many of the hardship claims they still use today, saying that voice users were subsidizing the clunky online services of the time, and demanding that the FCC impose per-minute access charges on them. The nascent high tech community responded to the affront quickly.irate BBS sysops buried the agency in faxes (a novelty at the time), while firms such as IBM, Digital, and CompuServe persuaded a few members of Congress to intervene. In the end, the commissioners ruled for the Net and against the telcos, saying that it was inappropriate to assess per-minute charges on the fledgling online industry.

That ruling, which immunized ISPs and online services against access charges, is what the telcos now call obsolete. Access charges, paid mostly by long distance companies, added up to more than \$23 billion in 1996. These days, however, long distance companies like MCI and AT&T are cajoling the commission to reduce access charges, and the FCC seems sympathetic to the idea. This means long distance rates may soon be dropping. But it also means the Baby Bells will pull in less cash from long distance carriers – a potential shortfall that perhaps explains why they are now so hungry to levy access charges on Internet providers.

All this wonk warfare might have gone largely unnoticed on Main Street USA, were it not for an FCC Web page that solicited public input on the access-charge issue. Only a few comments trickled in during the first few weeks after the page was put up in December 1996. But as the spring comment deadline grew near, the word got out: the FCC was poised to screw the Net. Between February 1 and February 14, hundreds of thousands of irate emails flooded isp@fcc.gov. In message after message, Internet users pleaded, argued, and reasoned with the agency not to levy access charges. One message labeled the telcos' demands “just another scam so the greedy phone companies can separate even more money from consumers.”

This tidal wave of digital bile did not escape the attention of Reed Hundt, chair of the FCC. “Imposing today's interstate access charges on Internet users is the information-highway equivalent of reacting to pot-holes by making drivers pay for a new toll road,” 183 ►

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There's fast. And then there's fast. The MessagePad 2000 comes with a screaming 160 MHz RISC processor, which offers up to five times the performance of the 20-40 MHz processors you get with other handheld devices.

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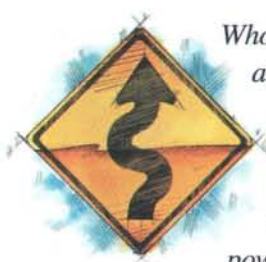
Twister

If a disaster strikes and no one's there to report it, does it make a sound? With the GPS Reporter, you'll have an answer. Built for the Japanese market by Toshiba and designed for use in the field, the Reporter consists of a digital still camera with a microphone and monitor, a GPS receiver, a computer for storing position data, and a cellular phone. The Reporter, in other words, lets you let the world know what's going on. And if it happens you end up needing some assistance yourself, that GPS data will ▶ have the rescue party looking in the right place. GPS Reporter: ▶ ¥1,500,000 (US\$12,230). Toshiba Corp.: +81 (3) 3457 4451.

F E T I S H

Edited by Tim Barkow

It helped to control frea



Who better to design and engineer a great handling sedan than people who are obsessed with power and control?

It was just such people who insisted Dodge Stratus ES have standard anti-lock brakes as well as a fully independent, modified double-wishbone suspension like you'd find in race cars.



They lobbied for an available speed-sensitive, variable-assist, rack-and-pinion steering system that allows for easy maneuvering in parking situations, yet provides plenty of road input at speed. They

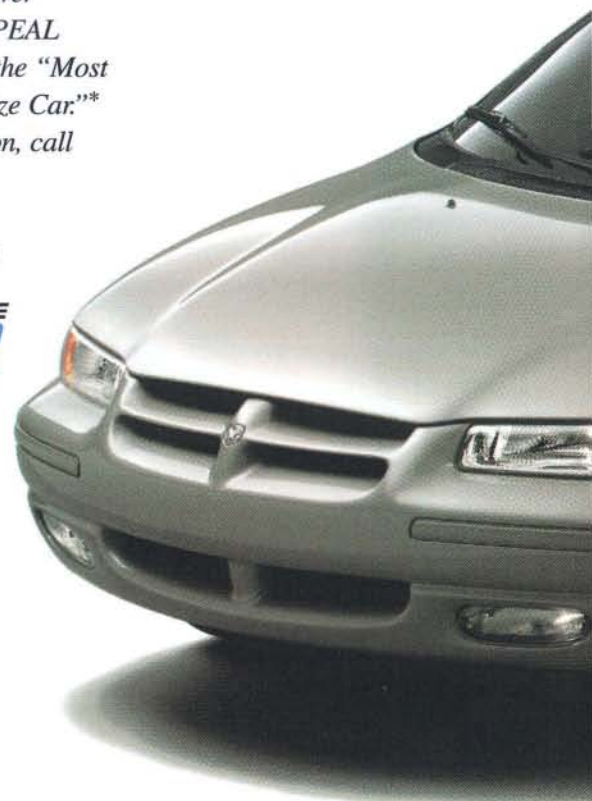
wanted the option of an AutoStick® transmission that gives you the responsiveness of a manual. And in their ultimate power play, they saw to it that Stratus ES has an available 24-valve, single overhead cam V-6.



But by meeting their demands, it seems we met yours, too. Because in J.D. Power and Associates latest APEAL Study™, Stratus tied as the "Most Appealing Entry Mid-Size Car."* For still more information, call 1-800-4-A-DODGE or visit our Web site at <http://www.4adodge.com>



Dodge is the official vehicle of the Skip Barber Driving School.



have a few
ks on staff.



Stratus  The New Dodge

Horsepower

The Triumph T595 Daytona may look like a flying banana, but you won't be slip-slidin' along while riding this high-powered bad boy. Packing a 955-cc engine that harnesses 128 horses of pure riding excitement, this three-cylinder motorcycle flat-out hauls. Backed by Triumph's impressive technology and incorporating its classic design, the T595 comes in strontium yellow and jet black. More important, it actually looks like a bat out of hell. Who would have guessed? Triumph T595: US\$10,695. Triumph Motorcycles Limited: +1 (770) 631 9500, on the Web at www.triumph.co.uk/.

Mini-Bar

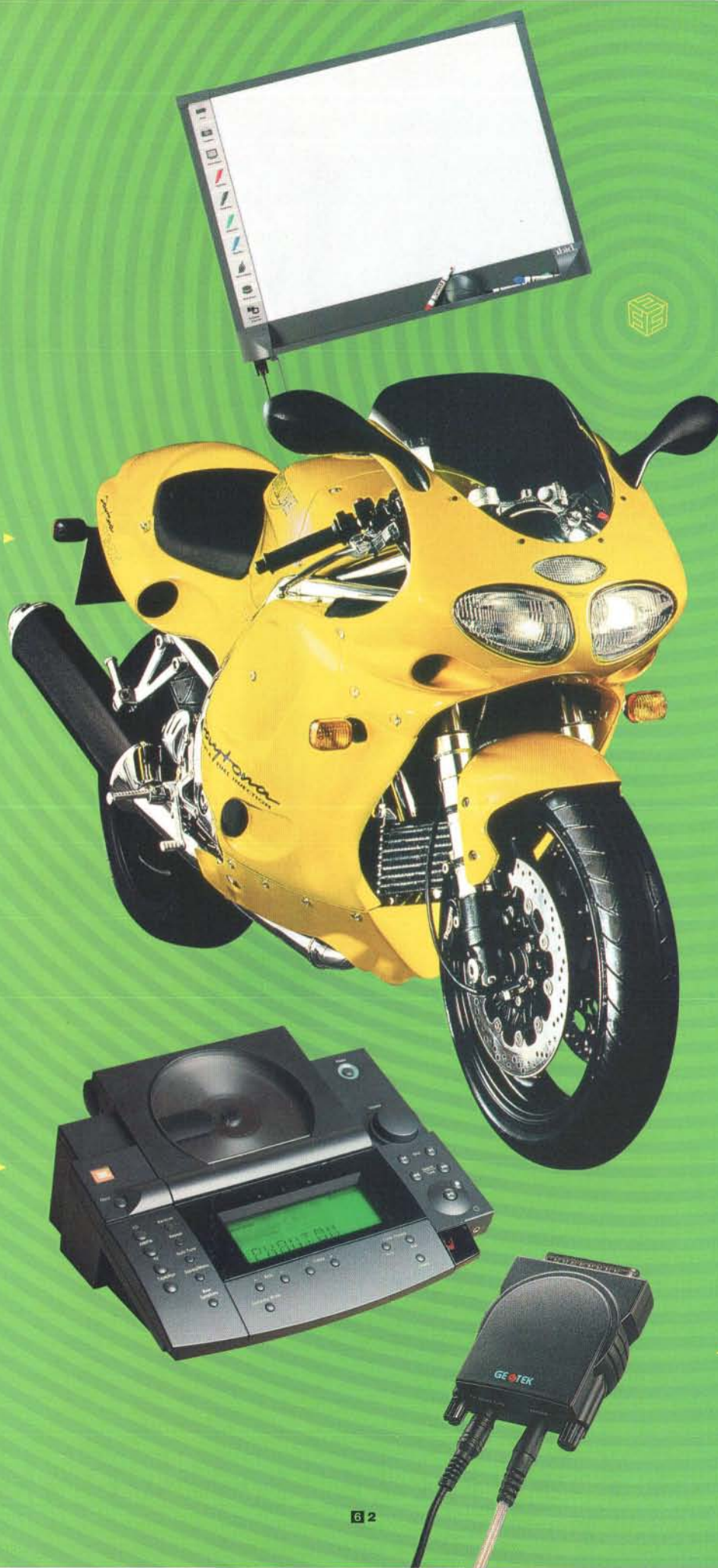
One thing technology has dispensed with is the need for larger-than-life stereos and monster-truck-sized speakers. JBL's ESC 550 satisfies your home theater needs simply and elegantly. Five satellite speakers and a 250-watt subwoofer swath the room in audio as you sit back, issuing commands to The Source, the 550's command center. Underneath its sleek façade lie a CD player, an AM/FM tuner, and a Dolby Pro Logic surround sound processor. Worried about your decor? It comes in black or white. ESC 550: US\$1,699.95. JBL: (800) 336 4525, on the Web at www.jbl.com/.

Chalk

Whiteboards are great, except what do you do with all those great diagrams and notes once you're finished brainstorming? Now you can have your whiteboard and eat it too. Ibid is a simple whiteboard system that connects to your PC. With it, you can do all the wild-and-crazy, out-of-the-box thinking you want, and then take your notes and print, email, or export them (as image files) into other programs. 'Course, for it to do any good, you've got to think of something really worthwhile to scribble. Ibid: US\$499. MicroTouch: (800) 642 7686, on the Web at www.microtouch.com/.

Analog

A common joke making the rounds calls the mailing list push media's killer app: No hassles. Low bandwidth. Now Minolta is doing for audio what the mailing list does for text. The PCFM Receiver plugs into your Wintel PC's 25-pin serial port and delivers broadcast-quality radio direct to your sound card. While the rest of the world struggles to glimpse postage-stamp-sized QuickTime movies, you'll be enjoying Fresh Air with Terry Gross and drinking your morning coffee. PCFM Receiver: US\$59.95. Minolta: +1 (201) 825 4000, on the Web at www.minoltausa.com/.



S/el Automatic Chronograph



Ph: Hans GISSINGER

TAGHeuer

P R O F E S S I O N A L S P O R T S W A T C H E S



Bash

Keith Moon might turn in his grave, but when it comes to digital rhythms, the Yamaha DTX electronic percussion system will take some beating. The updated module can synthesize 880 drum sounds, and the onboard five-track sequencer will record MIDI data and let you layer five notes on one drum. And while the DTX will definitely loosen up your drumming style, playing it in the swimming pool is not recommended. OK, Keith? Nine-piece DTX Electronic Percussion System: US\$2,335. Yamaha Corporation of America: +1 (616) 940 4900, on the Web at www.yamaha.com/.

Stun

The Star Trek Phaser Remote turns couch-potato time into space exploration. Eager for a little telematic justice? When the cantankerous McCoy starts messing with that pointy-eared cutie called Spock, just zap the ornery sawbones with the mute. Press a button and out shoot surprising phaser sounds, zapping Oprah where it hurts. And adding to your pleasure as you key in commands, the universal remote emits a deep, satisfying ruby glow. Kirk never had it so good. Star Trek Phaser Remote: US\$39.95. The Edge Company: (800) 732 9976, on the Web at www.edgeco.com/.



Print

Digital cameras are great, but how do you get the pictures out of your PC and into your scrapbook? TruPhoto is the final step in eliminating the Fotomat from your life forever. The printer's heat- and ultra-violet-light-sensitive Thermo-Autochrome paper produces 144 pixels per inch, delivering 3.5-by-5-inch images that are near photographic quality. The manual stinks, but with some practice you'll get results you'll be proud of. TruPhoto: US\$449. Panasonic Interactive Media: +1 (408) 653 1888, on the Web at www.truphoto.com/.

Mode

Surfer Pro is the new dépêche mode. In the form of a tiny surfboard, this stylish modem supports data speeds up to 33.6 Kbps and fax speeds to 14.4. Sporting a brightly colored "surfsuit," it comes armed with software applications to send and receive data and faxes and store voice messages. Once you get over the corny surf analogy, you'll be pleased to learn the Pro comes equipped with browser software. Surfer Pro: £149 (US\$238). Psion Dacom PLC: +44 (1908) 261686, email dacom@psion.com.

Thanks to Jesse Freund, Anne Speedie, Megumi Ikeda, Tadashi Ibi, Wired Japan, and Wired UK.

Best Consumer Digital Camera

(MacUser EddyAwards, Jan.'97)

Product of the Year

(InfoWorld, Jan.'97)

Stellar

(Windows Sources, Jan.'97)



(ComputerLife, Feb.'97)



Any questions?

Plenty. How many pictures does the D-200L take?

Up to 80.

You're not sure?

You can shoot in both high-resolution or standard formats. And switch back and forth whenever you want. Even delete the shots you don't want at any time.

How do I know which ones to delete or keep?

You can instantly view the images you just captured.



Where?

On the color LCD screen. One at a time or nine at a time.

What's the resolution?

640 x 480. But you're not buying a pixel taker. It's pictures you're after. And

picture quality is where the D-200L really outperforms the competition.

Who says?

InfoWorld, for one: "The image quality far surpassed any of the other digital cameras." And *Windows Sources*: "It delivers the best images we've seen from a consumer-level camera."

What about the lens?

It's a razor sharp, wide angle, macro, Olympus glass lens.

Flash?

With red-eye reduction, fill flash and auto mode.

But does it feel like a camera?

With an optical viewfinder and Olympus design, it follows in the footsteps of the Stylus series, the most successful line of 35mm cameras in the world.

Okay. I take a color shot.

Now what?

Download the image into a computer, either Windows™ PC or a Mac®. Then go to town.

Talk to me.

Create multiple images from one image. Or combine several. Add and subtract color. Retouch. Crop.

Go on.

E-mail it across the Internet. Put it on a Web page. Store it on disk.

Suppose I want to be creative?

With the included Adobe PhotoDeluxe™ software you can make greeting cards and real estate listings, design layouts, put together mail-order catalogs and newsletters. All in full living color.

Hold it! How much is all of this going to cost me?

\$599.

That's it?

That's it.

There must be a science to all this.

And an art.

To learn more about the D-200L and how it completes the ideal home or office imaging system, contact your Olympus Marketing Representative at 1-800-622-6372. They'll also tell you all about the new Olympus personal storage system and CD writer.

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Orbit. It's a trip.

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Buckle your seatbelts and get ready for Orbit.

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your own hand. The result is out-of-this-world comfort and total fingertip control of your cursor.

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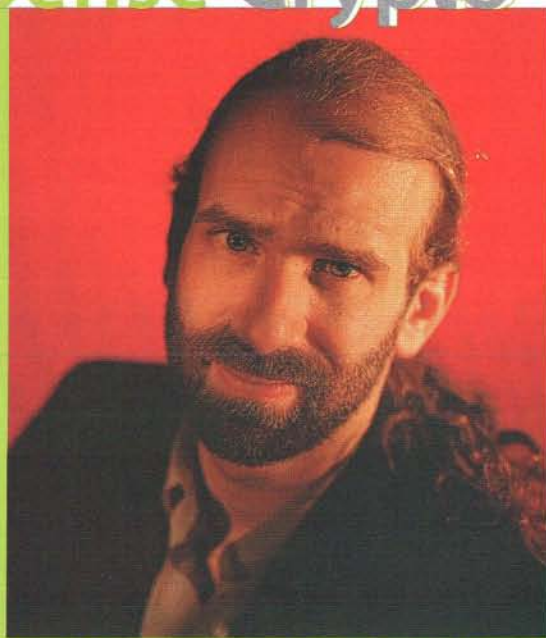
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MICRO CENTER SEARS

Common Sense Crypto

When Thomas Paine published *Common Sense* in 1776 – arguing that the American cause was not merely a revolt against unfair taxation, but a demand for independence – he had no idea that more than 200 years later, the struggle for freedom would be waged between privacy advocates and the national-security establishment. This time, the dispute is over not taxation without representation, but communication without government intervention.

One of today's crypto revolutionaries is Bruce Schneier, the neatly dressed, ponytailed author of *Applied Cryptography*. Schneier also recently helped identify a key flaw in the encryption scheme the US digital cellular industry had adopted for use in cell phones. Although Schneier is well known in the cryptography community, few realize he also developed the Blowfish encryption algo-



Bruce Schneier: aboveboard in the underground.

both unbroken and unpatented – a feat that has earned it a place in dozens of commercial products, including Symantec's Norton Your Eyes Only and McAfee's PCCrypto.

Blowfish is a free encryption algorithm that remains unbroken and unpatented.

rithm – a symmetric block cipher with a key length that varies from 32 to 448 bits.

Schneier designed Blowfish in 1993 to satisfy the need for an effective and free encryption algorithm to replace the aging DES standard. After almost four years of public testing, Blowfish remains

While Schneier hasn't made any money from the widespread adoption of his algorithm, he's satisfied that Blowfish has earned its users' trust.

Schneier's Web site belies the popular image of privacy advocates as rogue cypherpunks and disgruntled militia types with something to hide. As president of Counterpane Systems,

a consulting firm specializing in cryptography and computer security, Schneier is too enmeshed in the high tech industry to qualify as a true subversive. Consistent with his above-board persona, the Blowfish source code is conspicuously absent from www.counterpane.com/ – a fact that Schneier ruefully attributes to "the administration and its export laws."

Instead, he simply provides links to sites beyond the reach of the US government, where others have made his code available for public scrutiny.

Although several crypto liberalization bills were introduced in the US Senate last spring, Schneier remains wary of government-backed encryption proposals. Were he more fearful of prosecution, he might never have released Blowfish into the wilds of cyberspace. But as he sees it, "It's always better to seek forgiveness than to ask for permission."

– Tom Claburn

Shake, Wobble, and Roll

If you want your printing job done perfectly, don't bother calling John Upchurch and Matt McClintock. The two art school grads own and operate Fireproof Press, a letterpress and graphics company that specializes in small print runs, hand-set type, and customized packaging that recalls an earlier era.

In their third-floor shop in Chicago, Upchurch and McClintock maintain five electric and treadle-driven presses – cast-iron monsters whose blueprints reflect late-19th-century designs. The bulk

of Fireproof's business comes from independent record labels looking for a distinctive CD or LP jacket. More than 40 artists – including Steve Albini, Rachel's, Tortoise, and Stereolab – have contracted Fireproof to crank out their covers.

"Each piece is its own thing, rather than some reproduction of an ideal on a computer," Upchurch says. "We're not reproducing things, we're producing them." – Colin Berry



Perfect imperfection.



CHANGE THE WAY YOU GAME

Ever tried to stay awake through those games that promise "complete immersion"? You know, the ones that make you sit passively through a bunch of predefined video streams – or worse yet – subject you to cheaply rendered environments?

NEVER AGAIN.



Introducing SouthPeak Interactive's Video Reality.™

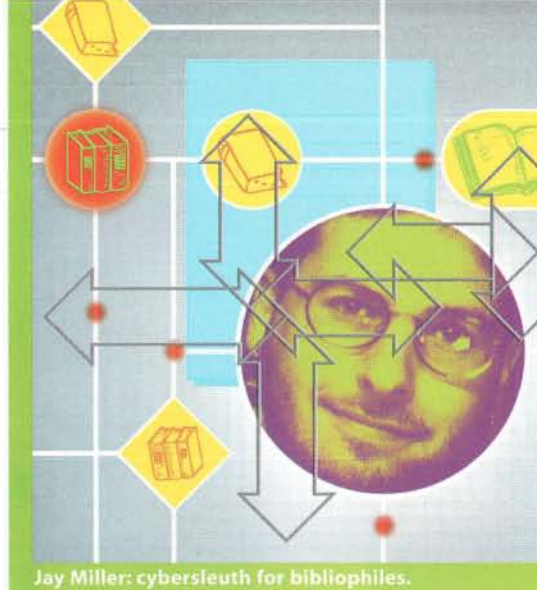
It isn't a game. It's the driving force behind a new breed of games. Immerse yourself in 360° of insanely realistic, completely seamless, motion picture-quality gaming.

Coming soon to CD-ROM games near you.

Antiquarian Book Hack

As the battle for online book sales gathers momentum, Berkeley, California, bibliophile Jay Miller is settling into his market niche like dust on a book jacket. Miller, 26, has tapped into a network of dealers, collectors, and libraries to create an online search service for rare and used volumes at www.eastbaybooks.com/.

Miller's East Bay Book Company has all the charming chaos of a second-hand bookstore. But in lieu of crusty professorial types browsing the stacks, twentysomething crunchies stare at computer screens, processing up to 400 requests a day from all over the world. "People drive themselves nuts searching for old books," Miller says, "but I can locate a first-edition copy of *Finnegans Wake* within minutes." Meanwhile, he's laughing all the way to the bank. "I started with US\$690 and a 486 PC," he says. "Within a year, I grossed \$375,000." — Rachel Lehmann-Haupt



Jay Miller: cybersleuth for bibliophiles.

Squish That Tune!

In 1995, Anthony Stonefield was a 32-year-old independent music producer when he read about a new music-

Now Stonefield has formed his own company, Global Music Outlet, with the first and only license to use AT&T's compres-

sound samples, you can open an account with a credit card, and if you hear a song you like, you pay just 99 cents to download it for keeps. Using Electric Record Player freeware, you can replay the song from your PC whenever you wish. Other Web sites offer music that you can call your own, but most charge artists to participate, then give the music away. Under Stonefield's scheme, artists receive royalties for their work.

Born in South Africa, Stonefield's tastes are eclectic, so Global Music features African artists such as Johnny Clegg of Juluka in addition to mainstream acts such as Foreigner and Christopher Cross. Stonefield expects to have 10,000 songs online by year's end.

Making money is an obvious priority, but Stonefield also hopes Global Music will enable artists with a different sound to more

sion scheme for commercial music distribution. The system is three times as efficient as

Global Music's compression scheme cuts sound files to 4.5 percent of normal size.

MPEG-2, squishing sound files to 4.5 percent of their normal size with no perceptible loss in quality, so that a 4-minute song fits into 2 megs of disk space.

After browsing Global Music's Web site for free, 20-second

easily find an audience. But can Global Music really connect users with vital new talent? Drop your needle on www.globalmusic.com/, and listen for yourself.

— Charles Platt

Jargon Watch

Check-Box Item A feature added to a product solely to meet a requirement on a spec sheet, regardless of the feature's utility to the user.

Electronic Immigrants Telecommuters who cross borders to compete for jobs in more affluent countries.

Interstitials The latest scheme in Web advertising, these ads pop up as the reader moves from one page to another. Advertisers love interstitials because they can be sure that the user will notice their ads.

Para-site A Web site that wraps its own identifying frame around other sites that are linked from it. Para-sites often create confusion as to who is responsible for a page's content.

Spush Indiscriminate, spamlike applications of push-media technology.

Tip o' the straw hat to Andrew Anker, Donna Hoffman, and Kevin S. Liske.

— Gareth Branwyn (jargon@wired.com)



Anthony Stonefield will expose you to something different.

compression technology that had recently been developed at Bell Labs. Stonefield reached out to touch AT&T — and told the company to do things his way. "I said that if they built in copyright protection, this would be the ultimate solution to music distribution over the Net. Luckily, someone listened. AT&T formed a business division to support the product, and they hired me as their consultant."



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Dream Weaver

What does it mean when you go downstairs in the morning to find Bill Gates serving you coffee while Claudia Schiffer carries in a plate of flapjacks? Wake up, pal! It means you're dreaming.

But according to Jeremy Taylor, America Online's dream expert, "there is no such thing as a dream with only one meaning. All dreams have multiple layers of significance." Taylor believes that only a dreamer can genuinely know what meaning his or her dream may have – an understanding that usually

other people's dreams for more than 25 years. In late 1969, he was inspired by a community effort to fight racism. After struggling with ineffective methods, Taylor began asking people to share their dreams about racism based on his belief that doing so brings relief to people afflicted by repressed racial hostility.

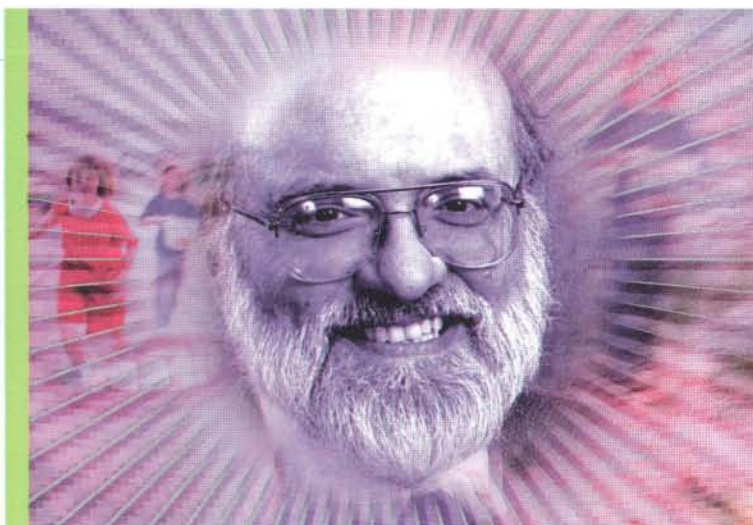
When America Online asked Taylor to practice his dream-analysis techniques in cyberspace, he wasn't sure that the Internet is a personal enough medium for such intensely emotional work. But after he relented to the provider's pleas, Taylor was pleasantly surprised by the results. Taylor

On AOL's Dream Show, dream-analysis techniques have come to cyberspace.

arrives as a wordless "aha!" of self-realization.

Taylor, an ordained Unitarian Universalist minister and an instructor at several San Francisco Bay area colleges, has been combing through

says that despite the absence of facial expressions and body language online, you can still conduct high-quality dream work on the Web. "I miss the visual clues, but there are also clues in language and keyboard slips that are also quite revealing! A compensation process



Jeremy Taylor can help decode last night's secrets.

comes into play when the interlocutors are invisible to one another."

On AOL's Dream Show, a person named Kairosmg describes the late-night wanderings of his subconscious. "What does it mean when I dream about a girl I work with who has a baby, and I move my whole family into her house?" This cyber dreamer adds that the woman's neighbors are gangsters and that he witnesses a shootout in the dream. Keyboards tap furiously as chat

room participants rush to decipher the layers of meaning. Taylor adds that death is an archetypal metaphor of psychospiritual growth and change.

Taylor is negotiating with AOL to create an online training program for those who guide others through group dream analysis. "Only online skills can be taught online," he says. "But eventually, with the availability of videophone technology, these distinctions will disappear." – Marissa Raderman

Wired Top 10

Technologies Americans most appreciate

Product	% Totally Positive
1. Microwave oven	77.3
2. Universal remote control (TV/VCR)	66.6
3. Garage-door opener	64.6
4. Home telephone answering machine	61.7
5. Ear thermometer	59.5
6. Breath analyzer	59.2
7. Programmable home thermostat	58.3
8. Call-waiting telephone service	56.4
9. Automatic payroll/government check deposit	55.1
10. Supermarket price scanner	55.0

Results based on a survey that asked consumers which products have improved their lives most.

Source: *Predatory Marketing: What Everyone in Business Needs to Know to Win Today's Consumer*, by C. Britt Beemer (William Morrow, 1997).

– Gareth Branwyn

The Entrepreneur Next Door

Persian Kitty's Adult Links has become a veritable Yahoo! of Web smut – a jumping-off point for adult content. The material is explicit, but equally eyebrow-raising is the site's mastermind: Beth Mansfield, a Tacoma, Washington, homemaker who is cashing in on her serendipitous creation.

Mansfield, 36, created Persian Kitty to see how many people she could pull onto one spot on the Web. The answer, in a word, is millions. One month after she posted her homepage in 1995, Mansfield's ISP kicked her off for attracting too much traffic. A few weeks later she was up and running again, meticulously cataloging adult Web sites by content and cost at www.persiankitty.com/.

Persian Kitty has prospered ever since. Today, it boasts a whopping 425,000 impressions a day and generates US\$80,000 a month in advertising revenue. A former accountant, Mansfield takes a clinical view of prospective Persian Kitty listings: "I look at the structure of a site, see what they offer, and I'm out." – Matt Richtel



Meeeeoww!

Scissors CUT HERE

#11

ORGANIZE **INDOOR BASEBALL**

TO LEARN MORE ABOUT
INDOOR FUN, GET ON
THE WEB AND VISIT THE
STATION @ SONY.COM

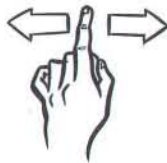
START CRUMPLING
HERE



1. Tear out this page and crumple into a ball. Wrap ball with tape for desired hardness. Protective headgear? It's your head, so it's your decision.



2. Roll up magazine and grip tightly in hand. Note: Avoid throwing the bat after you swing. It can inflict some nasty paper cuts on the fans.



3. Recruit between 1 and 17 other players. Choose sides using "eenie-meenie" method. Negotiate players' contracts, if necessary.



4. All rules of outdoor baseball apply. And yes, spitting on the ground is not only expected, it's encouraged.

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Les Scavengers des Techno-Objets

Millions and millions of tons of obsolete machinery are scattered about the country. Objects that cost millions to design, build, use – and, finally, trash – now lie inert in scrap heaps and salvage yards. Some of the junk is scientific equipment, some is cast-off hardware from the postwar military-industrial complex, and some of it is very, very beautiful.

Want a stylish brace of 4-foot-high silver tubes once used in cryogenic research? Or maybe a Teflon-coated matting from a Trident missile canister? Or an earthquake compression bushing for highway bridges that looks like an overgrown bar of soap? Not to worry – Electrokinetics's EKG

thing is 16 feet long and 4 feet wide and weighs a hell of a lot, but imagine what a conversation piece it will make! Plus, it's a steal at only US\$25,000.

"We're going after people who are bored with the art world," EKG cofounder Leo Fernekes says. "Our typical customer has always been in love with technology and now has the means to relish that appreciation."

A 6-foot-3-inch wraith in black jeans and enormous black boots,



Ideal for the home ... or the hangar.

The EKG Gallery is a haven for art aficionados trolling for gorgeous technological garbage.

Gallery has it. Situated on the fourth floor of a warehouse in New York's NoHo district, the EKG Gallery is a haven for art aficionados trolling for gorgeous technological garbage.

The gallery's centerpiece is a hand-rubbed aluminum CJ805 jet engine from a 1960s-era Convair 880. The

Fernekes seems an unlikely harbinger of retrotech design. But as a fabricator and engineering whiz, he has long been drawn to the beauty of machines – and, working with partner Stefan Rublowsky, he's now translated that appreciation into a burgeoning gallery business.

All that background comes into

play as Fernekes roots around a Southern California salvage yard, "absolutely orgasming" over all the machines and equipment baking in the sun. "Omigod!" he practically moans, pointing to a giant glass cylinder with pipes and gauges inside. "Look at that! It's a Hydra-Set Model C!" The monstrous device once measured fluid pressures in increments of tens of thousands of pounds per square inch. Form followed function, and, by happy chance, it looks cool. Best of all, some New York style junkie is going to pay a pretty penny for it. – *Allen Whitman*



Sigma6: from Second Wave to the cutting edge.

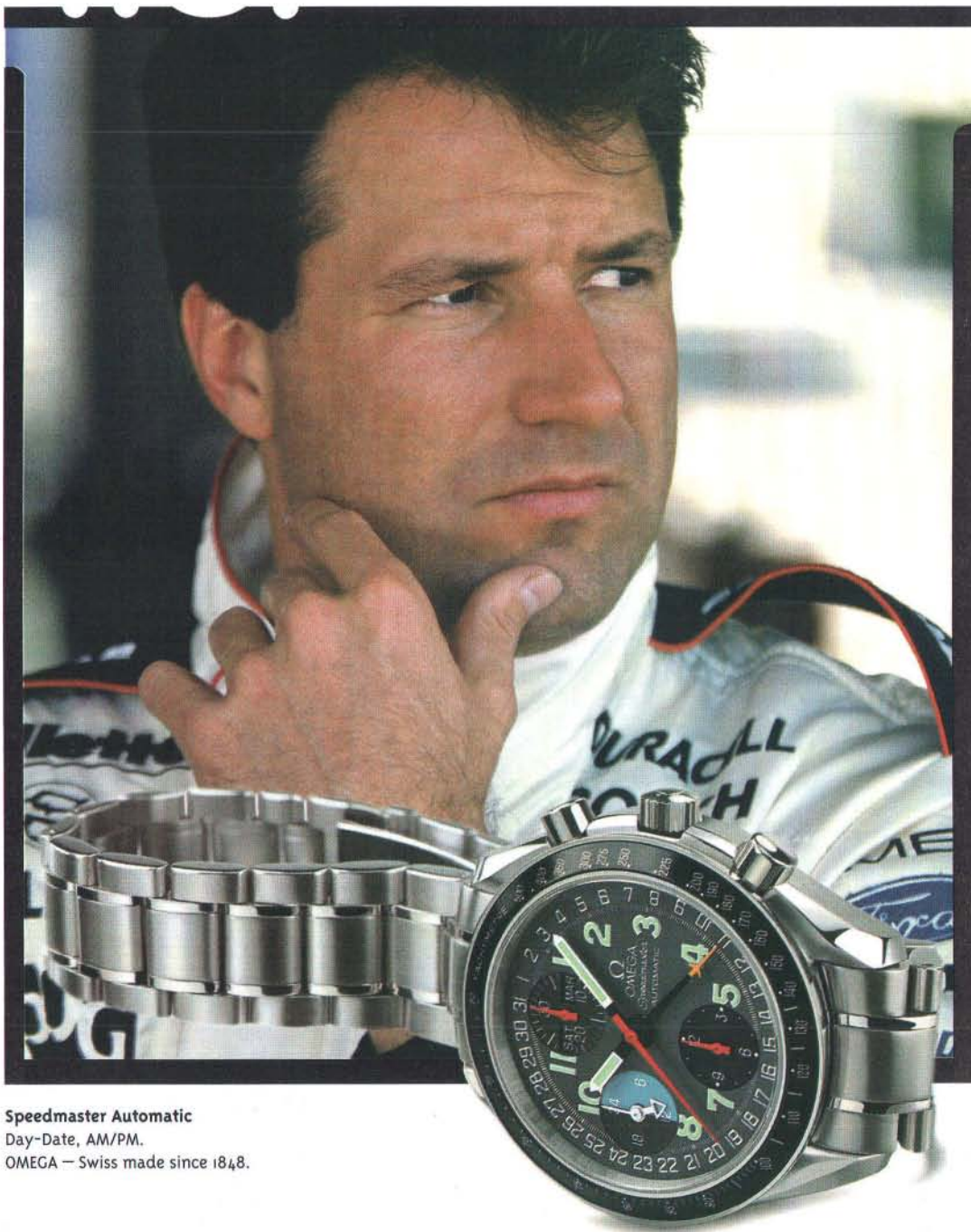
Motor City New Media

In a market full of digital heretics, Detroit-based Sigma6 is breaking the mold for interactive media and digital design. Positioning itself in "the gap between mainstream media and underground culture," the company's projects range from Web sites for the automotive industry to enhanced CDs and music videos for electronic music labels.

Sigma6 core members Russell Zack, William Tigertt III, Rod Sanchez, and Jani Anderson have used their edge in the Motor City's unsaturated market to fund independent projects and ventures. "New media is the bridge," Zack exclaims. "We've had stuff on MTV Europe and the Detroit Auto Show!"

Besides working with Detroit's techno underground and GMC's truck division, Sigma6 is coming out with a fashion line called bit-wear and a digital comic book for the Web. Rather than applying old content to new technology, Sigma6 regards digital media as a cultural conjunction. Says Zack: "Conceive-construct-connect is our idiom as we count down to 2000." – *Amitav Koul*

Michael Andretti's Choice



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DynaMO 640

- 640MB per disk
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- Interface: SCSI-2
- Access Rate: 35ms
- Maximum Transfer Speed: 3.9MB/Sec.
- Cache: 512KB/2MB

DynaMO 230

- 230MB per disk
- Backwards compatible with 128MB media
- Maximum Transfer Rate: 1.6MB/Sec.
- Cache: 128KB/512KB
- External and internal versions for portable and desktop systems



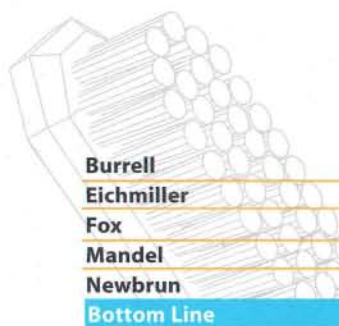
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The Future of Dentistry

You've heard the hype.
We asked the experts.
Here's the real timetable.

The first toothbrush was invented in China circa AD 1000 and featured bristles made of horsehair. Since then, dentistry has come a long way: smile-straightening braces have evolved from gold metal to clear plastic, millions of Water Piks have been bought as gifts and never used, and the crinkled

toothpaste tube has been reengineered as the freestanding pump. While we happily rot our teeth with chewing gum, scientists continue to develop new technologies that should make each checkup better than the last. The focus, however, is on prevention – so don't forget to floss.



	Cavity-Repairing Toothpaste	Laser-Drilling of Cavities	Effective Cure for Halitosis	Substitute for Dental X Rays
Burrell	now	2010	2020	2020
Eichmiller	1999	unlikely	2007	now
Fox	now	2005	1999	now
Mandel	2003	2005	2000	2005
Newbrun	unlikely	unlikely	now	now
Bottom Line	1999	unlikely	2005	2003

Kenneth Burrell
DDS; senior director
of the American Dental
Association's Council
on Scientific Affairs

Fred Eichmiller
DDS; director of the
American Dental Association Health Foundation
Paffenbarger Research
Center

Christopher Fox
DMD, DMSc; director
of global professional
relations for the Colgate-
Palmolive Co.

Irwin D. Mandel
DDS; professor emeritus
at the Columbia University School of Dental
and Oral Surgery

Ernest Newbrun
DMD, PhD; professor
emeritus at the University
of California at
San Francisco

In the next few years, a new toothpaste called Enamelon will face off with Crest in the battle for your mouth. The company behind Enamelon promises that the product, which includes calcium and phosphate in its formula, actually prevents cavities by rebuilding the surface of the tooth. Does this signify the death of the dentist's drill? Wishful thinking. All of our experts point out that traditional fluoride toothpastes already decrease demineralization and increase remineralization. According to Eichmiller, newfangled Enamelon-type toothpastes "will most likely function in much the same manner but with much greater efficiency." Unfortunately, Fox adds, "once the caries (tooth decay) progresses to the state of cavitation, or a physical hole in the tooth, you'll need more than toothpaste." Bzzzzzzz....

Forty years since the first air-turbine drills went into service, that high-pitched whine still sends shivers down the spine of anyone who has ever had a cavity filled. So what's next? According to Mandel, lasers are currently under study; acceptance will depend on the ease of use, cost, and safety compared with standard drilling. Burrell notes that lasers have even "demonstrated effectiveness at sealing pits and fissures on the biting surfaces of molar and premolar teeth." On the other hand, Eichmiller believes the amount of energy that must be generated to ablate tooth structure is "too large to ensure survival of the tooth vitality." Lasers, adds Newbrun, are more likely to be used to control bleeding.

It's no wonder dentists wear cloth masks – bad breath is most commonly caused by bacteria on the tongue and teeth. That's why a good brush sometimes helps. But a perfect cure for halitosis is unlikely, Mandel says, since "the oral cavity can't be sterilized." Still, Newbrun adds, "the common toothbrush and a tongue scraper are very effective in controlling halitosis." If you're one who enjoys the swish-and-spit routine, mouthwashes that contain zinc compounds are your best bet, Burrell explains. For better results, we'll have to wait for a new antimicrobial. And with a public that's willing to buy into the stigma of bad breath, expect miracle mouthwashes to hit the shelves again and again. "Consumer demand will drive companies to invest heavily in this area," says Fox. Well, that's one way to look at it.

Do you get suspicious when the X-ray technician grabs the remote control and scurries out of the room? While the radiation emitted from dental X-ray machines is not harmful in small doses, better image analysis combined with new technologies may reduce patients' exposure time. According to Eichmiller, colored dyes and electronic impedance detectors are useful in locating lesions. In addition, Burrell points out, digital imaging technology like MRI is already in place, but when it comes to dental use, "sufficient resolution would be needed because the early decay lesions are extremely small." Other methods involving fiber-optic systems and ultrasound technology will reach wide-scale acceptance in less than a decade, predicts Mandel. Until then, please bite down and keep your head still.

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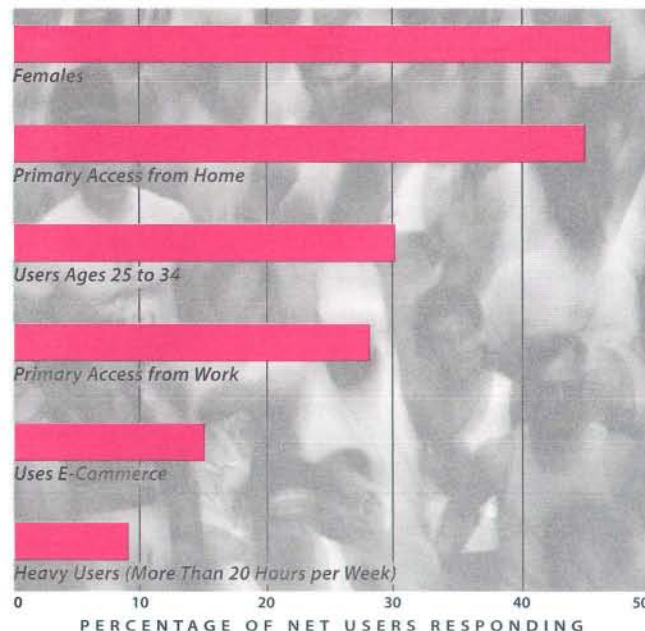
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Online Rundown

The results of Internet surveys finally seem to be stabilizing. As Net fever rolls across the planet, growth continues at an absurd pace, but other statistics, such as the proportion of female users, have leveled out. With sites like bookseller Amazon.com leading the way, e-commerce seems to be gaining acceptance, and it's probably just a matter of time before everyone's in on it.

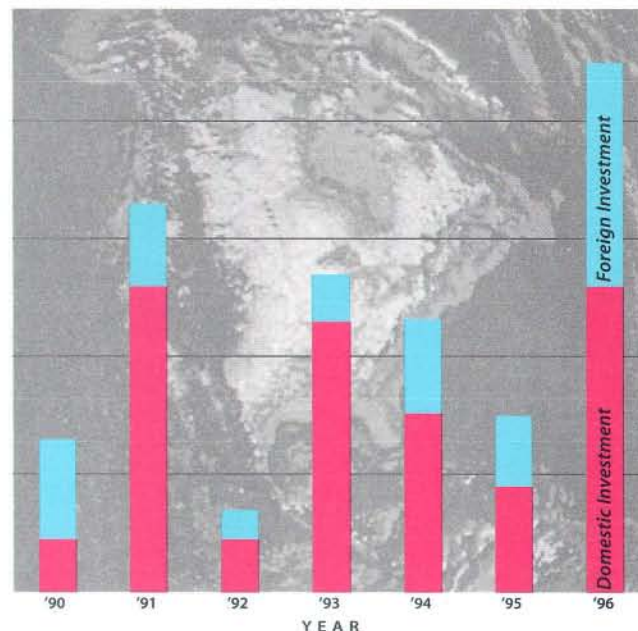
SOURCE: INTELLIQEST'S WORLDWIDE INTERNET/ON-LINE TRACKING SERVICE



The Value of Privatization

One of the inescapable signs that the world is changing comes as traditionally state-owned public telecommunications operators go private. Forty-four PTOs have made this shift since 1984, generating almost US\$159 billion, a third of which has come from foreign investment. Privatization should improve global telecommunications while helping to erase national borders.

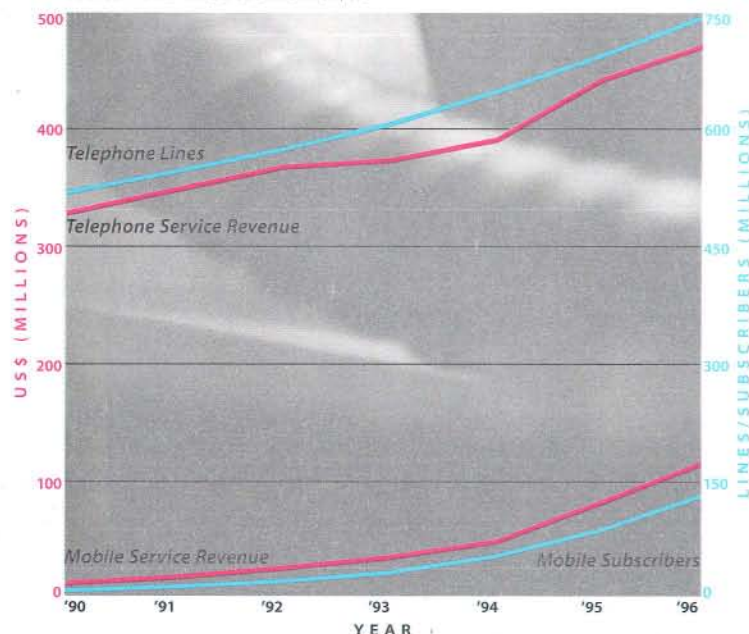
SOURCE: INTERNATIONAL TELECOMMUNICATIONS UNION PRIVATIZATION DATABASE



More Phones, More Money

The debate over establishing tariffs for ISPs is one the Bells may never get over – win or lose. And though big telcos warn that data traffic will destroy our phone system, they're really worried about losing profits. But revenues from those wicked (usually used for data) second phone lines are propping up local phone monopolies quite well. So what are they complaining about?

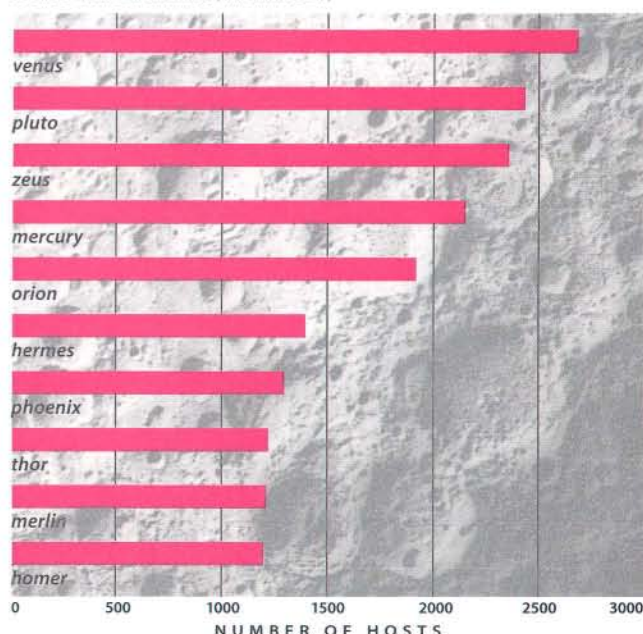
SOURCE: WORLD TRADE ORGANIZATION; ITU



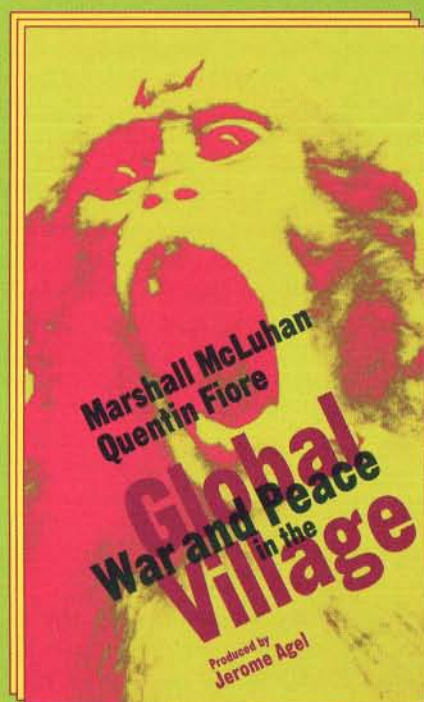
Naming Your Network Hosts

Excluding standard networking descriptors (such as www, which dominates all other host names), these are some of the appellations your systems administrators love best. Most monikers reveal a taste for mythology, perhaps D&D induced, but knowing how inscrutable computer systems can be, homer probably refers not to *The Odyssey's* author but to the father of Bart.

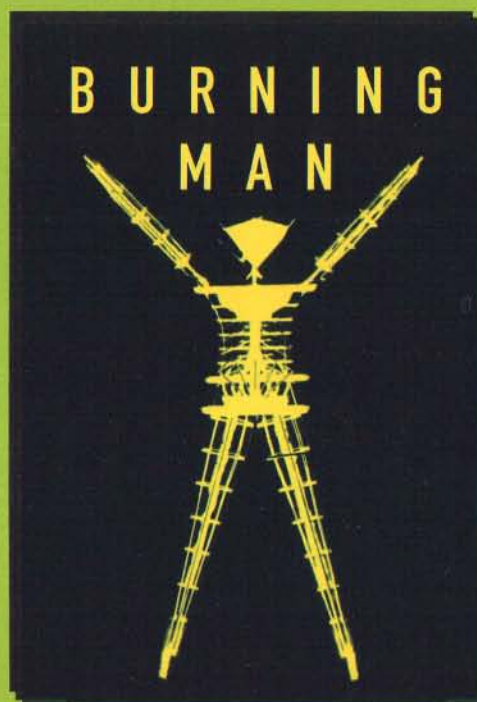
SOURCE: NETWORK WIZARDS (WWW.NW.COM/)



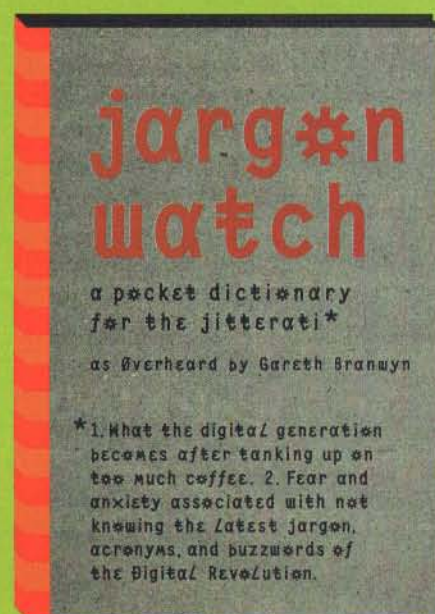
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Content-Based Image Retrieval

In other words, how the Naked People Finder works.

By Mark Frauenfelder

These bots,

One of the nicer attributes of search engines is the massive army of inexpensive, uncomplaining software bots you can employ to troll the Net, collecting textual content.

however, are next to useless when it comes to indexing the Net's millions of photographs, drawings, and videoclips. And since you can't search for them, images do not exist as researchable – or even useful – online content.

To construct an image index, human beings must be hired to sit at computers and plow through the Net, cataloging pictures one by one. Yahoo! and other search engines offer small image databases, but as long as meatbots – instead of softbots – are used to construct online image libraries, comprehensive indices will remain prohibitively expensive.

Some research programs, such as VIR Image Engine from Virage Inc. and Columbia University's VisualSEEK, offer content retrieval based on a user's request for images that contain a specified combination of color, shape, and texture. Querying one of these image databases amounts to drawing a rough sketch of the kind of visual you're looking for. Other programs compare a sample picture's content with other known images from a comparison database.

These kinds of approaches are useful in certain limited applications, but **what's really needed is a program that can automatically analyze a previously unclassified image file and describe what's in the picture without human assistance.**

Two university researchers have achieved encouraging results in content-based image

retrieval with a program that searches for a very specific type of image: naked people. David Forsyth, an associate professor in UC Berkeley's computer science department, and Margaret Fleck, an associate professor of computer science at the University of Iowa, have jointly developed a program, colloquially called the Naked People Finder (<http://cs.berkeley.edu/~daf/people.html>), that is designed to search through the files of an image database and retrieve pictures containing pictures of nudes.

Forsyth explains that **the consistency of skin color in most scanned porn images makes it an excellent first choice to test the finder algorithm.** Another reason for using pornography, says Forsyth, is "the large sample set – I got it from the Net."

The Naked People Finder does its job by first looking for image files that contain large regions of skin-colored pixels. "If you ignore how dark or light it is, skin has a very constant color," says Fleck. "The Naked People algorithm looks for an absence of strong texture." In a sample set of 565 images of naked people and 4,289 control images (of landscapes, animals, industrial sites, clothed people, et cetera), the skin filter selected 448 nude shots and 485 control images. The skin filter picked out 79 percent of the naked people – not bad, considering the range of backgrounds, textures, and colors found in the samples.

But Fleck and Forsyth's program incorrectly tagged 11.3 percent of the control images as naked people as well, which explains why the program also includes a geometric filter that goes to work on the set of selected skin images. This filter

targets areas tagged by the skin filter and attempts to discern whether limb segments exist within those areas.

To do this, **the filter assumes that the human body basically consists of cylinders.** "If the program finds a skin-colored cylinder, then it looks for another cylinder nearby," explains Forsyth. It then tries to group the cylinders into configurations within the human body's geometric constraints, which have been modeled in the computer as a "body plan." If it finds a sufficiently large configuration that meets the body plan's criteria, the image is tagged as a picture of a naked person.

In essence, the two-part system uses the same visual cues – color and large, recognizable shapes – that people use when skimming through a collection of images for a particular type of picture.

The program's geometry filter is a mixed blessing, however, because while overall it is more accurate, reducing the number of false positives, it also reduces the total number of identified nudes. The geometry filter screened out 62.5 percent of the false positives, so only 4.2 percent of the control images were selected. But the filter also threw out 36 percent of the nudes selected by the skin filter, dropping the yield from 79 to 43 percent.

The 4 percent of false positives included some "with the right color and elongated shapes," says Fleck, such as "stalactites, pumpkins, and desserts – especially pinkish-colored ones." The Naked People Finder team believes that it can improve the program's overall performance by tweaking the existing algorithms, combining the program with a system for

analyzing the text that's often included with images, or incorporating one of the many human-face-detection algorithms under development around the world.

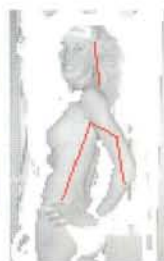
Fleck and Forsyth are now creating finders for animals other than humans. **Their horse finder, for example, employs a learned body plan,** as opposed to a hand-coded body plan like that used in the Naked People Finder. In other words, they developed the computer model used to represent a horse by feeding image data to the program and applying statistical learning theory to converge on a representation of a horse's structure. The horse finder program "is capable of recognizing horses in different aspects," says Forsyth, but "it isn't smart enough to tell a horse from a deer."

The ultimate goal of their research, Forsyth adds, is to create a general program that can examine any image file and "tell you what's in it – if it contains a person, or two jaguars – or something else."

As multimedia content becomes a greater force on the Web, it will be even more important that images and video be searchable – otherwise, we lose the real value of digital content.

But if Fleck and Forsyth's work continues as promisingly as it has begun, we may soon see commercial versions of algorithm-based image search engines that can dig through the Web automatically, finally making images as useful in the electronic sphere as online text has become. ■ ■ ■

Mark Frauenfelder (mark@wired.com) is an editor at *HardWired* and an editor-at-large for *Wired News*.



The skin filter leaves only skin-colored pixels.

Then the geometric filter tries to build stick figures to see if a human form is present.



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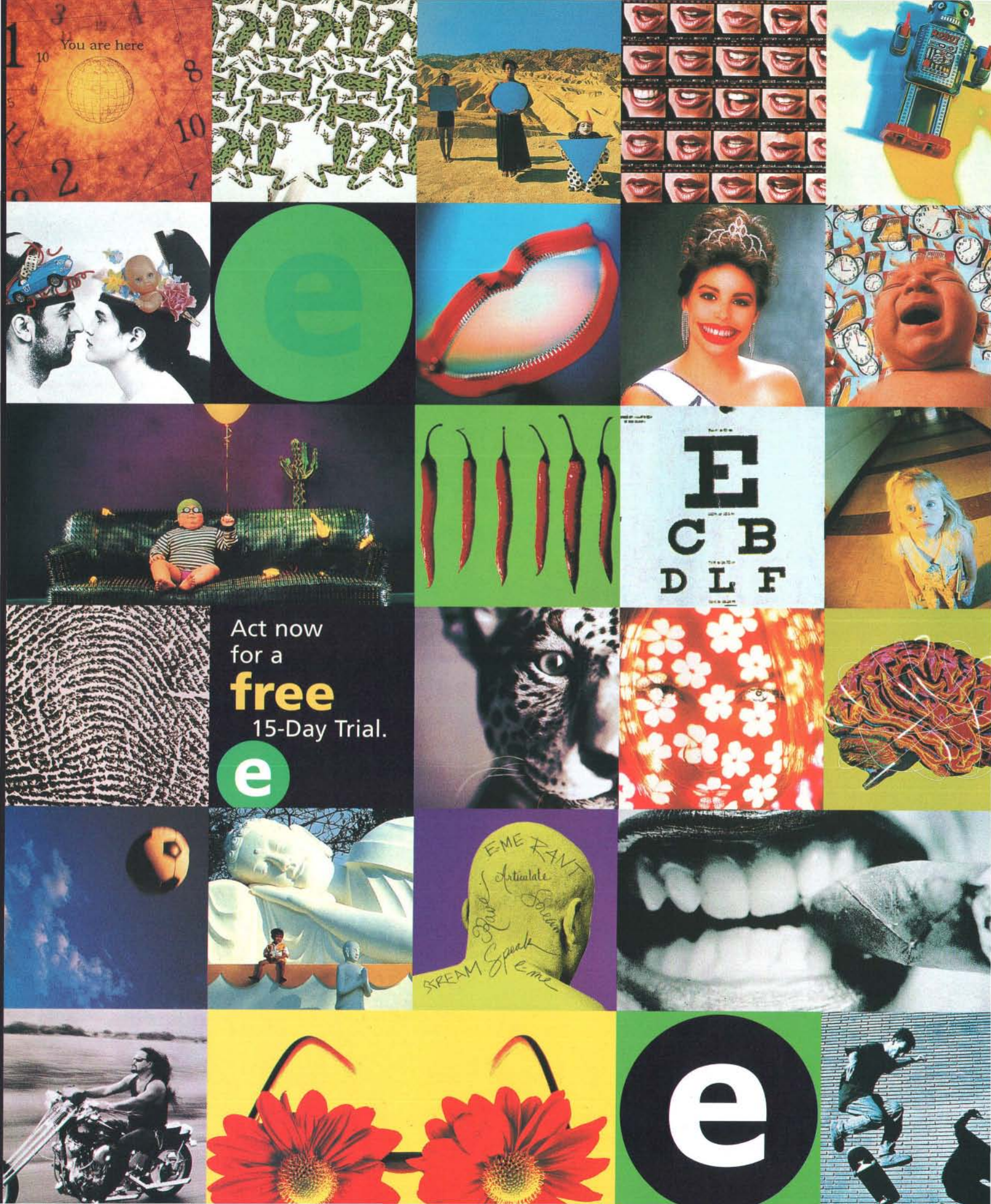
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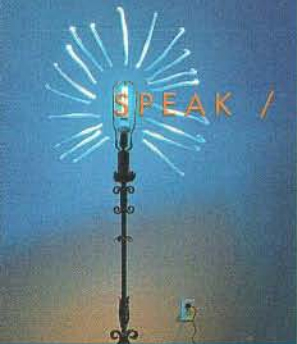
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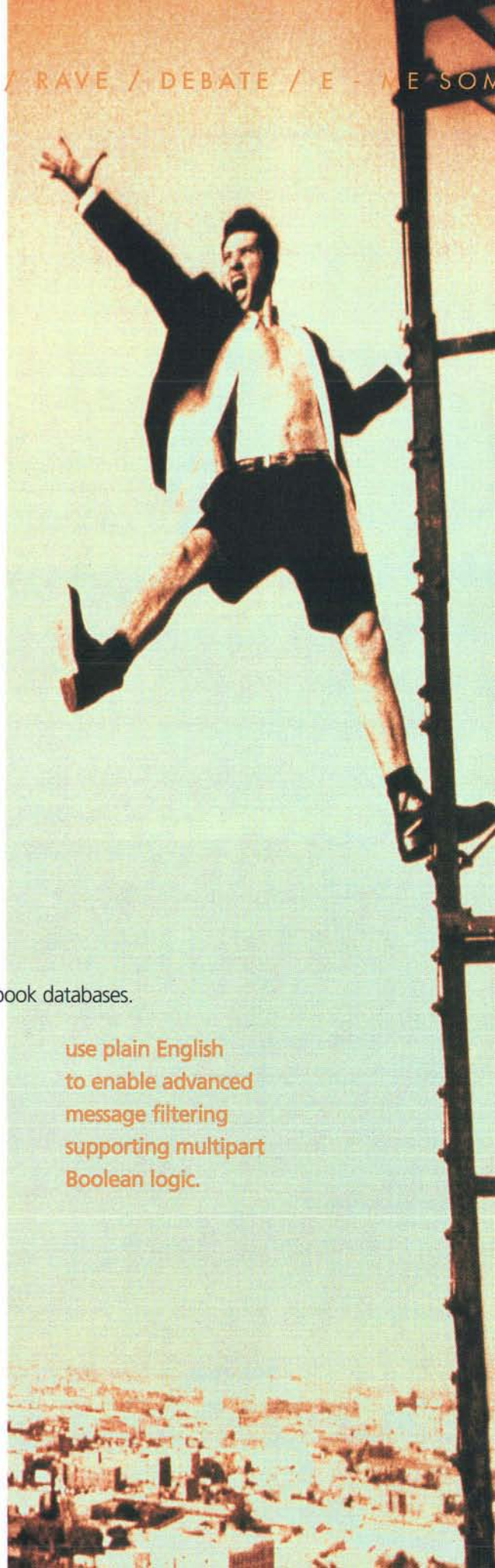
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Telecom Calls

This may be the digital age, but the data dispatched through your modem still travels over analog telephone lines. That will soon change. Who is likely to supply the digital lines?

By Michael Murphy

The telcos. And who will supply the telephone company with the equipment to build those lines? Some very interesting investment opportunities.

After years of slow change and steady, modest growth, the telecommunications equipment market is booming, driven by

Sales in the developing world are growing fast. But thanks to deregulation and technical improvements, the developed markets – which account for only 14 percent of the world's population – still consume 85 percent of equipment sales.

A telecom primer

The US telephone network has three major components: the local-access network, the public switched phone network (PSTN) backbone, and the Advanced Intelligent Network.

call is placed, the local switch creates a circuit, dedicating one of the PSTN connections to the call. If 25 percent of the subscribers are on the line, everyone else gets a busy signal.

More recently, the industry has developed alternate routes to the central office to circumvent the analog line card and digitally switch into the PSTN. Pairgain technologies, which convert analog traffic to digital, can carry 32 conversations. This increases capacity without the expense of increasing the number of wires.

The business PBX (private branch exchange) usually connects to the central office via a digital T1 line at 1.54 Mbps. Other technologies that extend digital transmission into the local network include ISDN for 128-Kbps service over two dedicated channels connected to the local exchange switch, ADSL for higher speeds up to 8.4 Mbps, and DLC – digital loop carriers – connecting 96 or more narrow-band lines onto a high-speed trunk (consisting of four T1s) and then to the central office. These technologies serve different tiers of service at different price points, and all will be part of the evolving telecom landscape.

But back to investing ...

In the equipment sector, the big seven providers include Lucent (formerly AT&T), Northern Telecom, Alcatel, Siemens, Ericsson, Fujitsu, and NEC. These vendors make or acquire the access, switching, and transmission technologies necessary to build a network from end to end. Big, diversified, and well followed, these companies tend to be fairly valued, so I'm not buying any of them right now. Good values do arise from time to time. Look for a chance to buy companies at less than eight times growth flow (earnings

per share plus R&D per share) with sales growing at least 15 percent each year.

Small companies are driving the market in access devices, which concentrate traffic from different sources onto digital trunks connected to the central office. Many access devices connect one of the broadband data-transmission standards like asynchronous transfer mode or frame relay to the switched telephone network. In this area I like Sync Research (SYNX); its stock is down from \$20 last November to less than \$4 because of a flat fourth quarter, which overwhelmed the good news of an important network contract from Visa International.

More sophisticated devices offer integrated access for multiple forms of data and voice traffic transmitted over digital trunks to the central office. The leading company is Premisys Communications (PRMS), whose stock tumbled from \$65 to less than \$8 when its major reseller, Paradyne, lost a couple of contract bids. Premisys competes with Newbridge Networks, Tel-labs, and Nokia, but offers the most flexible and powerful integrated access solution. Buy both SYNX and PRMS up to \$12.

TWITS

The portfolio is underweighted in communications stocks, which had been overvalued for months before coming down hard in the first quarter. I am adding 17,000 shares of Premisys. The new advanced object relational database made by Informix (IFMX) can handle any type of data, including multimedia information, and gives the company a substantial technology lead. I am buying 3,000 shares. ■ ■ ■

Michael Murphy is a money manager who publishes the California Technology Stock Letter in Half Moon Bay, California.

The Wired Interactive Technology Fund (TWITS)

Company	Primary Business	Symbol	Shares	Close Apr 1	Δ Since Mar 3	Action
Adobe Systems Inc.	Software	ADBE	5,000	39 1/4	+ 3 1/4	hold
Applied Materials Inc.	Semiconductor equip.	AMAT	4,000	47 1/4	- 4 3/4	hold
Diamond Multimedia	Multimedia hw	DIMD	7,000	8 1/4	- 4 1/4	hold
Intel Corporation	Microchips	INTC	1,500	139 3/4	- 6 1/4	hold
LSI Logic Corporation	Semiconductors	LSI	7,800	35	+ 1/2	hold
Macromedia Inc.	Multimedia sw	MACR	14,000	9	- 1 1/2	hold
Mattson Technology	Semiconductor equip.	MTSN	30,000	9	- 1/4	hold
Octel Communications	Voice hw/sw	OCTL	5,800	15 1/4	- 3	hold
Sequana Therapeutics Inc.	Biotech	SQNA	10,000	13	- 1 1/2	hold

New Stocks

Informix Corporation	Database sw	IFMX	3,000	9 1/2		buy
Premisys Communication Inc.	Telecom equip.	PRMS	17,000	8		buy

Cash Holding \$26,646.88

Portfolio Value \$1,737,596.88 (+73.76% overall) - 5.40%

Legend: This fund started with US\$1 million on December 1, 1994. We are trading on a monthly basis, so profits and losses will be reflected monthly, with profits reinvested in the fund or in new stocks.

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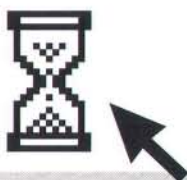
a combination of deregulation, new technologies, and strong international demand.

Worldwide telecommunications spending is divided between equipment and services. For every dollar spent on equipment – an estimated US\$180 billion in 1997 – telcos spend another \$5 on local and long distance calls, directory assistance, and other services. Worldwide services spending should grow 10 percent a year for the next few years, driven by falling prices in developed countries and first-time availability in developing nations. Overall equipment sales will expand at twice that rate as competitors, scrapping for market share, race to offer new and improved services.

The local-access system, or local loop, carries voice and data traffic from the subscriber to the central office, which routes local calls and connects non-local long distance traffic to the PSTN for transmission to other central offices.

For nearly a century, the standard connection to the central office has been a pair of twisted copper wires carrying a 64-Kbps analog signal. This narrowband or voiceband subscriber line is connected to a line card in the local exchange switch at the central office.

Historically, the ratio of line cards to PSTN connections has been about 4-to-1, because statistics showed that a typical person makes about five nonlocal 10-minute calls a day. When a



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Beyond the Brain

Alternative artificial lifestyles.

Artificial intelligence suffers from its reliance on the much-ballyhooed human brain, so say the organizers of the European Conference on Artificial Life in Brighton, England. In their attempt to build thinking machines, AI researchers often forgo the valuable experiences of other carbon-based life-forms. However, a-life advocate and event chair Inman Harvey says that we "see the rationality of humans as an incidental and often over-rated characteristic."

Artificial-life theorists study the most basic facets and forms of life – such as the traits of slime molds, insects, and mammals – and borrow not just intelligence but adaptive behaviors to build into artificial beings. Whereas Alers build computer programs that can play chess, a-lifers synthesize robots that can cross a street without getting creamed.

Modeling and re-creating biological phenomena in computers, a-lifers pursue two goals: to use these models to better understand

real-life issues, and to incorporate the ideas of organic systems into the development of computer hardware and software, medicine, and nanotechnology.

At ECAL, presentations on topics such as evolutionary computation, swarm intelligence, and collective behavior will shed light on life processes. And demonstrations by companies like Millennium – the team behind the a-life game

Creatures, which programs adaptive behavior into computer-generated

characters – will uncover some marketable aspects of artificial-life theory.

Perhaps most exciting, the First Autonomous Robotics Football Tournament will be held in conjunction

with ECAL. The robot that uses vision, path planning, and strategy to score the most points will win US\$1,000. It's artificial intelligence versus artificial life. Rational thought meets slime mold. And the winner? Both, of course.

Registration: UK£350 (US\$560). Contact: email ecal97@cogs.susx.ac.uk, on the Web at www.cogs.susx.ac.uk/ecal97.



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Extreme Sport

Robots play soccer. So what? Let's see them try to play a *real* sport. At the Octopush Club in Brighton, England, members play an underwater form of hockey that would challenge the most advanced bot.

Invented in 1954 by British diver Alan Blake, octopush was originally intended to keep military divers in shape during the long winter months. Today's players

do it for fun. Strapping on snorkeling gear, they dive to the bottom of a full-sized pool and use sticks to pass a 5-pound metal puck – which octopushers call a squid (go figure) – toward the opposing team's goal. Octopush's large and *immersive* 3-D environment would tax any state-of-the-art robot's path planning.

This summer, the national octopush tournament will

be held near London. Call it the Super Bowl of underwater hockey. Check the date of this and other Brighton Octopush Club extravaganzas at www.thenet.co.uk/~squid/octo.html. It'll be well worth the effort. Some poolside shenanigans, along with a few tasty mai tais, should be the perfect antidote to the mechanical machinations of robot soccer players. – Jesse Freund

The Current Roundup (see *Wired* 5.05)

June 19-21 E3; Atlanta. • **June 26-29** Shareware Industry Conference '97; Warwick, Rhode Island. • **June 30-July 3** International Conference on Artificial Intelligence and Law; Melbourne, Australia. • **July 5-6** Consciousness Reframed: Art and Consciousness in the Post-Biological Era; Newport, Wales. • **July 13-16** Genetic Programming 1997 Conference; Stanford, California.

July 13-16 **From Printing Press to Computer: The Future of Faith Communities in the Information Age**; Cambridge, Massachusetts. What are the metaphysical implications of worldwide connectivity? Is the Internet the ultimate metaphor for God? At this ecclesiastical event – sponsored by the Association for Religion and Intellectual Life – technologists and theologians will explore the impact of communications systems on human interaction with others and, ultimately, with God. Registration: US\$170. Contact: +1 (914) 235 1439, fax +1 (914) 235 1584, email aril@ecunet.org, on the Web at www.aril.org/.

July 17-19 **Trendwatch: Technology, Society, and Values**; San Francisco. The World Future Society's annual conference turns wild speculation into vocation. If you fancy yourself a futurist or just like hanging out with these forward-thinkers, don't miss this crystal-ball affair, featuring keynote speeches by Global Business Network president Peter Schwartz and digital-age author Hazel Henderson. Registration: US\$345 through June 30, \$395 through July 17. Contact: +1 (301) 656 8274, fax +1 (301) 951 0394, email wfsinfo@wfs.org, on the Web at www.wfs.org/wfs.

July 28-31 **European Conference on Artificial Life**; Brighton, England. See information at left.

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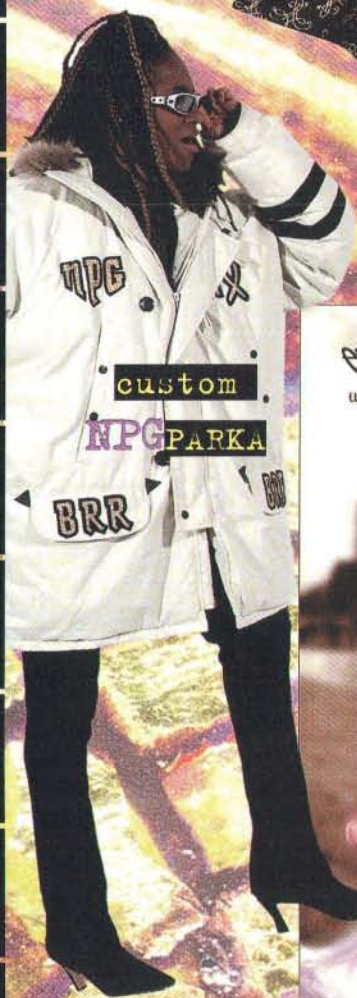
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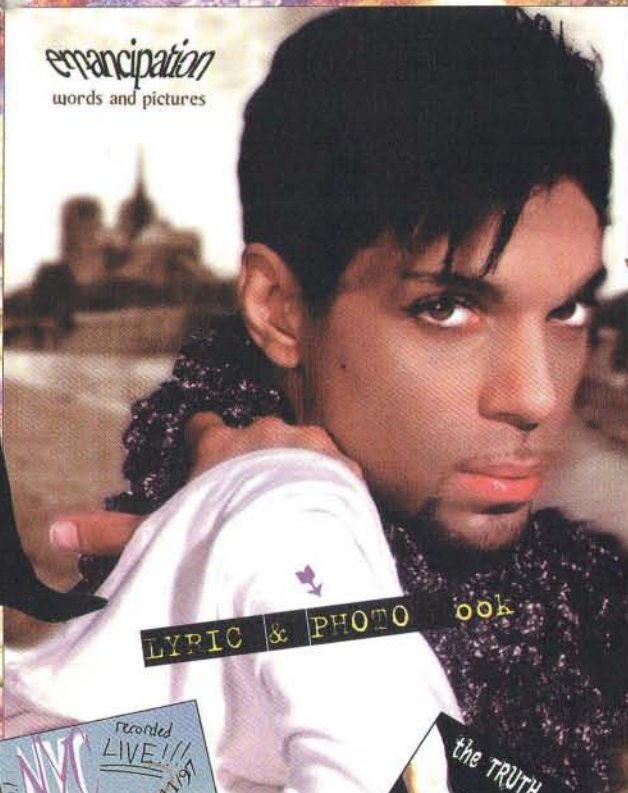


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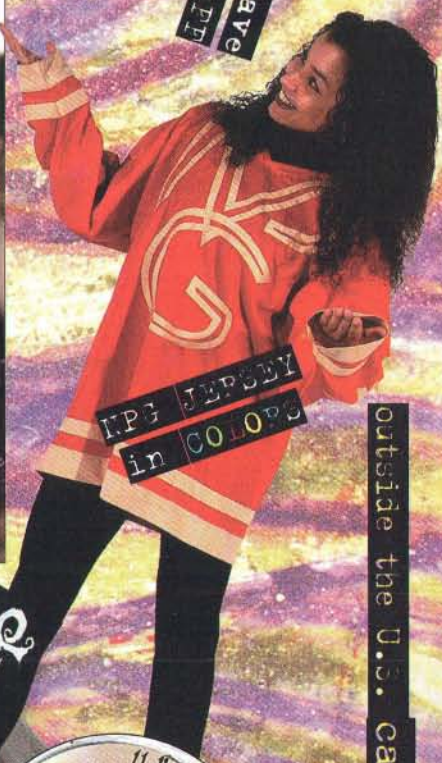
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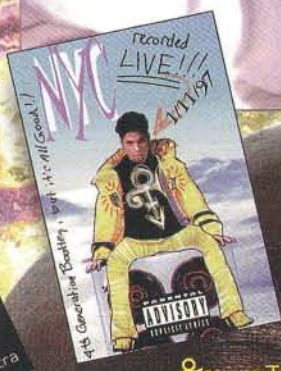


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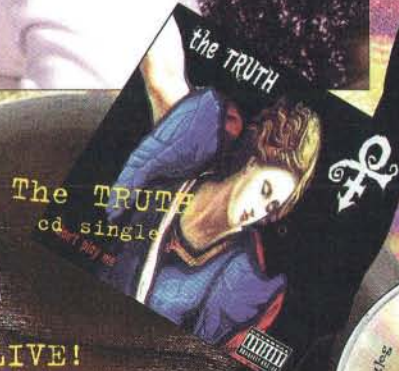
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Checked Out

Once hailed as a visionary of the "library of the future," then mired in controversy over San Francisco's US\$140 million new facility, Ken Dowlin resigned as the city's chief librarian in January. Since the main library opened in April 1996, patrons have complained of long lines and computer glitches, while bibliophiles – led by novelist Nicholson Baker – decried the purging of millions of books.

But Dowlin's coup de grâce was the reported \$2.8 million deficit. The book czar attributes the overspending to increased staffing costs (library use is up 300 percent). "We went from a DC-3 to a 747," says Dowlin. The librarians union, meanwhile, cites bad management and overinvestment in costly computers.

Dowlin – still a true believer in digital libraries – is running for president of the American Library Association.

[ORIGINAL STORY IN WIRED 1.1, PAGE 62.]

ALA v. Pataki: A Case of Indecency

If you popped open the Moët & Chandon when a Philadelphia federal court struck down the Communications Decency Act last June ... if you thought the Internet was safe from the dark forces of censorship ... think again. In the past two years, at least 17 states have passed or are considering legislation to restrict sexually oriented content on the Net. Some of these bills – aimed at pedophiles vending kiddie porn via computers – are laudable updates to existing child pornography laws. But New York, Georgia, Oklahoma, Virginia, and Maryland have passed laws that impose censorship as far-reaching as what the Philadelphia court found unconstitutional.

Enacted last fall, Section 235.21(3) of the New York State Penal Code makes it a crime to disseminate information "harmful to minors" via computer. Violation of the statute is a felony, punishable by up to four years in prison. Civil libertarians were quick to respond. In early March, the American Library Association, along with the Westchester Library System, the Association of American Publishers and others, filed *ALA v. Pataki* in the US District Court. "Telecommunication is going to be a primary means of communication in the 21st century," argues Judith Krug, director of the ALA's Office for Intellectual Freedom. "Librarians cannot live under laws that hold them liable for jail sentences if they use a computer to make 'indecent' information available to people younger than 18."

The New York law makes no attempt to distinguish between material inappropriate for a 5- or 6-year-old but suitable for a teenager. More troubling, the statute's definition of "harmful" material is broad enough to include information on AIDS, family planning, and homosexuality.

The ALA fears the legislation will prompt librarians to pull the plug on Internet connections rather than face jail time. "It's a serious situation," Krug says, "because a library's responsibility is to make available ideas and information across the spectrum. This law suppresses information under the guise of protecting minors."

Given the open and unregulated nature of the Internet, preventing indecent material from going to kids means preventing it from going to anybody, including adults. At an April 3 hearing, Ann Beeson, the ACLU lawyer representing the plaintiffs, argued that "the law criminalizes speech that is constitutionally protected," adding that "the Supreme Court has held that you can't reduce all communication to a level suitable for a 6-year-old."

If state laws such as New York's are allowed to stand, Beeson believes, the chilling effect on libraries – and on all free speech – could be even worse than that of the CDA because "the most restrictive state regulations will become the norm." Someone in Massachusetts who posts material that is "indecent" in Oklahoma could be extradited to the panhandle state.

Beeson expects a decision by early summer. Meanwhile, the Supreme Court opinion on the Communications Decency Act is expected in June or July. But even a ruling that the CDA is unconstitutional won't automatically void the New York law. As Beeson points out, a Supreme Court opinion striking down the CDA will not prevent state legislators from passing unconstitutional statutes. Net censorship will have to be fought state by state. – Hal Stucker

[ORIGINAL STORY IN WIRED 4.03, PAGE 104.]



High-Definition Deception

The HDTV swindle continued in March when the Oh-So-Grand Alliance of TV broadcasters announced its timetable for introducing the new standard: most stations now say they won't begin offering HDTV until after 2000. When the FCC balked, the National Association of Broadcasters revised the plan, slightly: within 18 to 24 months, 43 percent of US households will be surfing high-definition channels. This marginally faster timetable forced manufacturers Thomson Consumer Electronics Inc. and Panasonic to delay plans to offer HDTV sets in 1998.

More important, the broadcast industry's foot-dragging makes a farce of its deal with the FCC: high-quality digital programming in exchange for additional digital spectrum – at no cost. Yet the FCC is still committed to distributing new digital channels to every TV station in the country.

For the consumer, only one thing is clear: HDTV – or hogtied digital television – won't be a reality for years.

[ORIGINAL STORY IN WIRED 5.02, PAGE 57.]



America Still Online

They say that having the shit kicked out of you builds character. In America Online's case, the experience has strengthened the company's technological infrastructure, and its membership base is holding at 8 million. Following months of criticism over prolonged busy signals and technological shortcomings – not to mention class-action suits and fights with

state attorneys general over consumer fraud – AOL appears bruised but not beaten.

In fact, analysts say the recent pummeling helped the company. It spurred much-needed equipment upgrades, and, more important, the publicity spread the word among would-be netizens that AOL is the most popular and user-friendly access provider. "AOL's come through relatively unscathed," says Brian Oakes, an analyst at

Lehman Brothers. "Press reports that people are still dying to get in just create intrigue."

Competitors such as CompuServe and AT&T WorldNet Service attempted to stir up a little intrigue of their own by claiming they'd attracted thousands of disenchanted AOLers. Perhaps. But as America Online gets its act together, the chickens, so to speak, are coming home to roost.

[ORIGINAL STORY IN WIRED 4.12, PAGE 254.]

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Critical Mess

Sorting out the domain name system.

Let It Grow

US Senator Ron Wyden (D-Oregon) and Representative Christopher Cox (R-California) have introduced legislation calling for an indefinite moratorium on new taxes on electronic commerce. The House and Senate bills – both called the Internet Tax Freedom Act – seek to establish “a national policy against state and local interference with interstate commerce on the Internet.” The proposed legislation also prohibits the FCC from regulating prices charged by Internet service providers and calls for the Clinton administration to seek international trade agreements that make all Internet activity free of taxes, tariffs, and trade barriers.

Made in America?

Japan's Justice Ministry is rallying support for an anticrime bill that would give police extensive wiretap powers – a major departure given the country's constitutional guarantees for “secrecy of any means of communications.” According to activist Toshimaru Ogura, Japanese cops are modeling their proposals on US wiretap law, specifically the 1994 Communications Assistance for Law Enforcement Act (CALEA). The NSA helped sculpt CALEA's language, which begs the question: Is Japan's wiretap bill another one of the NSA's covert operations?

We Are the World

The fight for civil liberties in cyberspace knows no borders. The Global Internet Liberty Campaign, or GILC, is an online advocacy coalition representing 25 member organizations, including the ACLU, EPIC, EFF, Amnesty International, Human Rights Watch, and Privacy International. Committed to the defense of free speech, privacy, unrestricted encryption, and information access, GILC has focused its efforts on international policy-making bodies such as the G-7, OECD, and the European Union. Find out more at www.gilc.org/.

The Internet's domain name system (DNS) is bursting at the seams, and if the problem isn't fixed soon, governments may assert control over a fun-

By Roderick Simpson

damental aspect of Internet architecture. The Net's “positive anarchy” has become an international liability, and nation-states around the world are salivating at the prospect of stepping in to end the chaos.

The current crisis can be traced back to the early 1980s, when DNS was developed to help Internet users find one another by mapping prosaic names to numerical addresses – the Internet Protocol assignments given to each network host. Thus, for example, the domain name whitehouse.gov points to the IP address 198.137.240.91. And just as whitehouse.gov is a domain – a second-level domain, actually – so too is the .gov attached to it. In fact, seven such “generic” top-level domains (gTLDs) were created in all, including .com, .org, .edu, .mil, and so forth. The original assumption was that seven gTLDs would operate in perpetuity, without the need to create any more.

Few people then expected the Internet to grow into a mass medium. But today, .com has become the most popular home for the world's online commercial endeavors, leaving fewer and fewer choices that reflect company trademarks. As the number of available names has diminished, lawyers and con artists have used trademark-infringement lawsuits and extortion attempts to exploit the scarcity. Meanwhile, Network Solutions Inc. – the for-profit company that has maintained the gTLD registry since 1995 – has been reaping fat rewards from its DNS monopoly.

Internet gurus have called for the creation of new gTLDs to alleviate the congestion, but DNS is managed by a labyrinth of committees and working groups. Irresolute and lacking a clear chain of command, this system has allowed fringe elements to fill the vacuum, creating unsanctioned, “rogue” DNS registries and gTLDs (such as .corp, .club, and .sex) to challenge Network Solutions and its various paper-tiger oversight organizations.

Faced with the prospect of a DNS free-for-all, a closed-door group of elite Net policymakers convened in late 1996 and early '97 under the name International Ad Hoc Committee (IAHC) to sort through the muck and recommend future DNS structures.

The IAHC recommended the creation of seven new gTLDs to be split between 28 new registries. Trouble is, some of the proposed gTLDs will only redouble the trademark woes of existing .com occupants by forcing them to also set up shop on .firm and .store. Such implications prompted the International Trademark Association to issue a follow-up report which anxiously noted that “the world is shrinking!”

Sorting out the DNS mess is no easy task. Trademark law, long bound by notions of physical space and dissociated markets, is careening ass-first into cyberspace, which erases both. David Johnson and David Post, coauthors of the seminal paper “Law and Borders: The Rise of Law in Cyberspace,” write that domain names generate “a new type of property akin to trademark rights, but which is not inherently tied to the trademark law of any given country.”

This uncertainty – coupled with the indecision and clumsiness of the Internet architecture community – is making governments nervous, and some have

started dropping hints that it might be time to take over the entire DNS process.

A report leaked to *CommunicationsWeek International* from the Paris-based Organization for Economic Cooperation and Development stated that “the role of governments is to ensure that the administration and operation of the DNS is stable and that competition occurs in a fair and open manner.” As we go to press, 80 delegates are preparing to attend the OECD's first intergovernmental meeting to discuss DNS alternatives.

Here in the US, federal agencies are keeping close tabs on the DNS controversy. The US Patent and Trademark Office, the Federal Communications Commission, the Federal Trade Commission, and Ira Magaziner's e-commerce policy group have all expressed concern over the problem, and these agencies are now collaborating with a newly formed Federal Interagency Working Group on Domain Names to make sure the system is under control. Privately, US officials say the IAHC's proposal to create 28 new gTLD registries is a step in the right direction, but they insist that the overall framework for managing DNS should be subject to federal supervision.

If the DNS discord continues, the stage could be set for a reprise of the spectrum wars of the 1920s and '30s – a process that ultimately gave the FCC authority to license the ether as a “public resource” and regulate content transmitted over public airwaves. If the Internet community can't sort out the DNS problem on its own – quickly – then we may be handing governments a convenient invitation to sort out the mess ... once and for all. ■ ■ ■

Roderick Simpson (maclean@well.com) writes regularly for Wired.

From Innovation to Infrastructure

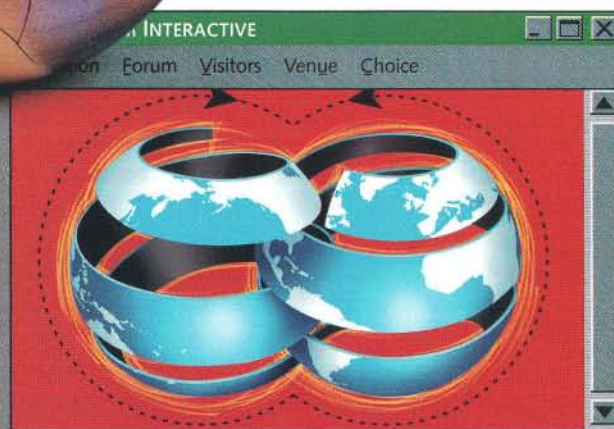
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Name-o-rama™

How *do* they come up with names like Pentium and AirTouch?

By Alex Frankel

www.wired.com/5.06/namemachine/



The booming high tech world is running out of trademarkable names. It's turning to a nascent naming industry that's coming up with the few words that stand out from the UniMobil-TeleDigiComLink soup.

At 9 a.m. sharp in Sausalito, on the San Francisco Bay, six people hunker around a wooden conference table in a giant green vault of a room once used by the navy and now used by Lexicon Branding Inc. As the floor heaters warm the crisp air, the group faces the imminent task: to name a computer network targeted at small businesses.

The assembled team – including an actress, a computer programmer, a writer, and three Lexicon staffers – seems alert, ready. The morning's orders, delivered by the coffee-sipping team leader, include an appeal to avoid the hackneyed word *net* in the day's brainstorming session. The

bill for service: US\$30,000.

The team leader starts by asking what a computer network really does. For a minute the question hangs in the air like a Zen koan, then the team members jump in. Someone makes the comparison to a home intercom system. The network is envisioned as a light-rail system, as a steel infrastructure, as a bible. The group moves rapidly through a slew of creative antics. With soft, calming New Age music in the background, the namers try their hand at writing advertising copy, they build on punchy tag lines, they watch the client's television ads. And then they write haiku poetry:

The fabric of work

Gliding effortlessly fast

Zigging and zagging

By midmorning, the creatives have

churned out hundreds of candidate names: Ensemble, Copernicus, Socket, Tango, Chainlink. The object is not so much to find the ultimate solution, but to keep the momentum going and build on the suggestions of others. "What about *blackberry*?" asks one consultant. "I see the network as a link of vines and tendrils. Oooh, what about *tendrill*?" The session proceeds.

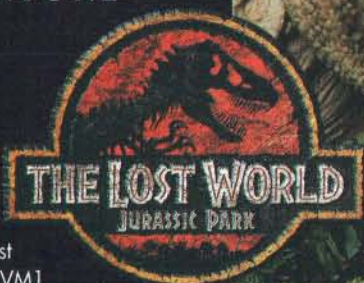
Finding the right name for a company or product can be critical in the deathly competitive high tech world. The most successful names become winning brands and the cornerstones of full-blown advertising and marketing strategies. Just 10 years ago, the industry held little mass consumer appeal, but the Digital Revolution has created the need for increased marketing to consumers – and it's forced companies to think hard about just what is in a name.

As the pool of registered trademarks expands, the difficulty in finding a suitable name increases. The Trademark Law Revision Act of 1988 is perhaps most responsible for the boom in the naming business. Since November 1989, entities have been able to apply for a trademark based on their "intent to use" it within 36 months – eliminating the need to have an actual product in the works. So even more names have been locked out of the running. Yearly trademark applications received by the United States Patent and Trademark Office have more than doubled since 1989, climbing from 83,000 in 1989 to more than 200,000 in 1996.

PowerBook, Compaq, AirTouch: these high tech corporate monikers are the results of lengthy research and consulting offered by a growing number of firms specializing in naming. The San Francisco Bay

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When Performance Matters.



area, with Silicon Valley's robust product-driven economy, has the world's most concentrated base of neologists. Each naming company seems to build on a somewhat different technique. One firm might use a vast database of language bits that it scans in a plodding fashion, creating names by fusing distinct word parts. Another company might make names through brainstorming frenzies. Whatever the method, it is this cadre of professionals who increasingly are putting names to our digital world.

PowerBooking through

Lexicon is the patriarch of the nascent naming business. President David Placek worked his way up and out of advertising proper to found the company in 1982, gambling on the need for such a niche. In 14 years, Lexicon has named more than 1,300 companies, products, and services. Over the years, the company's business has boomed along with the rest of the industry. Last year alone, with a staff of 15, Lexicon dished out more than 130 names.

The walls of Placek's office are covered

start to think and act alike. "What we are fighting here is a move toward commonality and away from diversity and divergent thinking. Our clients are paying us to think beyond where they thought."

One of Lexicon's best jobs to date is the PowerBook. In 1989, Apple had just introduced a heavy, ineffective portable machine – a failure. The computer maker needed a label for a new line. It hired Lexicon, which began working with the terms *laptop* and *notebook* and brought together focus groups of users of competitive products. Then came the serendipitous naming of PowerBook. From a semantic perspective, the company combined the word *book*, a small product that holds a lot of information, with *power*. "What you have in *PowerBook*," says Placek, "is two things that are very common but are not used together."

Together Lexicon's linguistic guru Bob Cohen and Stanford University linguistics professor Will Leben have researched the effects of sound on the way brand names are perceived. In *PowerBook* the *p* in *power* brings to mind compactness and speed,

of conveying layers of meaning. *PowerBook* was just two sandwiched words until its meaning was communicated through hundreds of advertising spots. In a word, it was branded. The names Lexicon creates are labels; clients create brands.

Morphing morphemes

If Lexicon mostly uses creativity to generate its yearly crop of names, NameLab Inc., located across the bay in San Francisco, uses a different approach: an almost scientific system of constructional linguistics. NameLab's database-driven wordsmith, Ira Bachrach, calls what he does grunt work. He doesn't consider the creative firms' lattes and brainstorming productive.

NameLab fashions its names strictly through tinkering with small word parts, called morphemes. All English nouns, verbs, and adjectives are composed of morphemes, the small semantic elements like the *van* – which means *front*, *top*, or *leading edge* – in *advantage* or *vanity*. Before Bachrach got to work, the largest dictionary of morphemes held just 1,400, organized phonetically by the 40 sounds in the English language. But he devised a notational system that expanded the definition of a morpheme and upped the number of usable word parts to 6,200.

Names hatched by NameLab, often neologisms or newfangled expressions, are stitched together by combining relevant morphemes into words that gain meaning. A consumer shopping for a sporty sedan, for example, implicitly knows that the morpheme *acu*, which Bachrach used to name Acura, means *precise* or *with care*.

In 1983, the founders of a start-up computer company approached Bachrach looking for a name with three implied messages: small, integral object, and computer. Bachrach used the morphemes *comp*, meaning *computer*, and *pak*, meaning *small*, *integral object*. The *k* in *pak* was changed to a *q*, because the company founder, Ben Rosen, wanted the name to stand out in the text of *The Wall Street Journal*. There are no other proprietary names besides Compaq with a terminal *q*.

**A typical project yields several thousand possible names,
but a client purchases only those it plans to use –
prices starting at \$30,000 per name.**

with sheets of white butcher paper marked up from many brainstorming sessions. A shelf is lined with 25 burgundy binders packed with the results of his years of naming. A typical project yields several thousand possible names that sometimes get reused in other projects. A company paying for names may browse the entire list generated during its project but purchases only those it plans to use – at prices starting at \$30,000 per name.

Though creative techniques vary, all involve tremendous consideration. At their finest, namers improvise like jamming jazz musicians to achieve a completely original result. But if you put a group in a room together, Placek says, after a while they

while the *b* in *book* suggests the perception of dependability, and both concepts are important underlying messages for the product, says Cohen.

According to Lexicon's standards, *PowerBook* falls into one of five categories of names – one that's "constructed." It considers a name like *Apple*, a typical noun, to be "real," whereas a word that does not exist, like *Pentium*, is "invented." The last two categories are "classical," such as *Merus* or *Athena*, and "compressed," like *Optima* (*optimal* without the *l*).

Regardless of the category, Lexicon believes the ultimate test is whether a name serves as nothing less than a "communications vessel" – or a name capable

Bachrach does not disguise his background as a straight-shooting electrical engineer. But in the 1950s, he studied in a linguistics PhD program at the University of Rochester, New York, where he researched morphemes with an IBM grant. That education paid off later in life. After retiring from several other careers, Bachrach founded NameLab in 1981. He took the company into a virtual sphere in 1995 and now meets daily with his staff in an intranet chat room to crunch morphemes. The staff includes two anonymous linguistics professors, who surreptitiously work around policies at their institutions to snatch a piece of the Silicon Valley action.

AirTouchy-feely

In the industry, NameLab is looked upon with a certain amount of disdain by others who value an approach that gets namers out into the world. That's particularly true of San Francisco's Idiom, a firm that champions elaborate outside engagement.

The Super Session, Idiom's signature service, is an all-day creative event. Idiom has just two principals, Rick Bragdon and George Frazier, who spend weeks preparing the agenda for each Super Session. They summon freelance professionals from various fields who can add diversity to the often-insular naming industry. Depending on the project, a Super Session might include a poet, an investigative journalist, or someone who styles food for still photographs. At a well-choreographed meeting, the crew might yield upward of 1,800 names in one morning.

A Super Session is filled with what Idiom calls game technology, like Synonym Explosion. In naming a children's edutainment product that supposedly makes the child's mind soar, the players go from the words *mind* and *soar* to others like *Einstein*, *sneakers*, and *rainbow*, which are later morphed by a computer program and massaged to yield names such as *Mindstein*, *Mind Sneakers*, and *Brainbow*.

Idiom involves clients directly in the creative process, which brings some unexpected results. During a break in one

Super Session, Bragdon and Frazier watched a company's two top executives engage in an impassioned round of Foosball. The sight of two grown men smacking around a Foosball impressed them. "We learned as much as anything about that company by watching the two top guys playing Foosball. This was a very active, powerful, driven couple of guys," says Frazier. The company name that emerged from this Super Session? *Wallop*.

Idiom's partners are as eclectic as their approach. Frazier's background includes stints as a cop, novelist, newspaper reporter, and private investigator. Bragdon, who has an MBA, worked in Pepsi's marketing department and was president of a design firm. As an avocation, Bragdon studies Jungian archetypes, those ideas and beliefs common to all humans and present in all cultures. "In naming, even if the archetypes are not consciously understood, they pack a lot of meaning," he says.

In 1994, PacTel Corporation was a \$1 billion cellular company struggling to find its own identity after being spun off from tele-

touchy-feely but also very '90s high tech - *AirTouch*.

The name crunch

So what's in a name? It depends on the decade. In the early days, when lumbering computers like ENIAC (Electronic Numerical Integrator and Computer) reigned supreme, names were little more than acronyms - impenetrable ones at that.

By the 1970s and 1980s, high tech names seemed to have beamed down from an alien planet. Names were full of *qs*, *xs*, and *zs*. Take Xerox, Xcalibur, Xidex, Xomox, Xonics, Xyrofin, and even Xonex, which was sued in 1978 by Exxon for using an anagram of its name. These names often were coined by engineers.

The '90s will be remembered for a batch of titles with character and personality: Ricochet, Yahoo!, Java, and Marimba, among others. Though these names were created without consultants, the pros appreciate that such names have shifted the standards.

Names in the 1990s also need broad con-

If naming styles seem to have taken an abrupt turn to the arbitrary, one reason lies in the sheer volume of registered trademarks - 750,000 at last count.

com giant Pacific Telesis. Bragdon, leading another naming group, was approached by the company to figure out a new name. He began running around the firm collaring workers and went out on the street interrogating cellular phone users. The company stiffly spoke in the technological double-speak of engineers, what Bragdon calls UniMobilTeleDigiComLink babble. The people on the street spoke about how their lives were crazy and out of control.

"Our investigation proved that people want cellular because it enables greater personal freedom, control, and interconnection. They want to stay in touch," he says. So Bragdon and company came up with an archetypical word, one that was

sumer appeal. In the 1970s, says Lexicon's Placek, Intel was far from creating a branded microprocessor. By 1993, when Lexicon created the name *Pentium* as a term to evoke a fifth-generation (*pente*) chip with resonance as an element (like titanium), Intel leveraged it into a big brand name.

If naming styles seem to have taken an abrupt turn to the arbitrary, one reason lies in the sheer volume of registered trademarks - 750,000 at last count. After a certain point, it grows hard to trademark words that use what NameLab calls "technoid nouns": like *com*, and *data*, and *tech*. In 1996 alone, there was a grand total of 8,128 trademarked names that included the morpheme *com*, 4,674 names with *net*,

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3,377 with power, and 1,073 with web, according to Thomson & Thomson, a trademark database research firm. "It is very hard to make names memorable and interesting if they are of that structure. They disappear into the noise," says Bachrach.

Even if you avoid hackneyed word parts, the sheer number of trademarked high tech names is still crowding out the field. The US Patent and Trademark Office places trademarks in 42 classes. Most high tech names fall into Class 9, defined as electrical and scientific apparatus trademarks. That class now has some 282,000 pending, registered, and abandoned trademarks; compare that to the 616,500 word forms listed in the entire unabridged edition of the 20-volume *Oxford English Dictionary*.

And even if a finely tuned naming machine such as Lexicon can think of a few thousand names, that's only the first step. It needs to get client approval, check trademark availability, and figure out whether the Internet domain name has been snatched. These are issues that quickly erode the numbers, a state of affairs that inspires fear in the naming industry.

Faced with this daunting landscape, Lexicon has spun off a new company, Riptide. The first of its kind, Riptide is a Bell Labs-like research wing that will try to create cutting-edge naming techniques. The company is small now, with just a few people on staff, but Lexicon intends to provide enough money and freedom to inspire this group to reinvent the name game.

Riptide's office is several miles from Lexicon, to give it some distance from the parent company's mind-set. Placek recalls how the US Air Force's stealth fighter was invented by the isolated venture that was Lockheed Martin's Skunk Works. Perhaps the time has come for a naming Skunk Works. "We need to get to higher ground," Placek says. Riptide is an attempt, at least, to promote divergent thinking as a way to avoid drowning in a sea of names. ■ ■ ■

Alex Frankel (acfrankel@compuserve.com) is a San Francisco-based writer and occasional name consultant.

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Speak the Future

A glossary for the Age of Access.

By Jim Taylor and Watts Wacker

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Spelling out "what happens after what comes next," *The 500-Year Delta* also demonstrates that a keen ear for idiom – and a knack for coining phrases – has become the currency of modern-day imagineering.

The 500-Year Delta, excerpted here, is the work of former Yankelovich partners Watts Wacker, now resident forecaster at SRI Consulting, and Jim Taylor, director of global marketing at Gateway 2000. Equal parts deep demographic research and divining rod, this wide-ranging guide to "what happens after what comes next"

spells out how convergence and accelerating rates of change have redefined the momentum of history. We have entered an era, in short, when chain reactions are governed not by the domino effect but by Slinky theory, a continuous expansion and contraction of social energies.

Yet the shifting landscape of the future, like the increasingly

competitive craft of futurism, demands more than a keen sense of historical cycles. In fact, an ear for idiom – and a knack for coining phrases – has become the currency of modern-day imagineering, whether you chase the hidden agendas of popular culture in the patois of street punks or trace the floor plan of the next civilization in the technobabble of Sand Hill Road. Looking backward, the true legacy of Naisbitt's Megatrends or Toffler's Third Wave may turn out to be not the worldviews but the words.

Mastering the new millennialist lexicon, it seems, is a primary thrival skill; a phrase on everyone's lips – think push – can quickly become the proverbial butterfly's wings.

Wacker's coinages already have seeped into many neotribes of the new economy, worn in "wordrobes" from the backwaters of the Web to the boardrooms of Silicon Valley. But use these words wisely: glossofacilia may be the quickest route to global pillory.

Age of Access The age we are already in, in which connectivity drives toward the access of everyone to everyone, everything to everything, and everything to everyone. The Age of Access impels new political and economic structures based on access, not scarcity. See **connectivity**.

Anthrolineage The résumé of cultural experience that allows one, in a time-compressed world, to immediately discover identity with a short-term other.

Bionomics Literally, the merger of biological and economic theory. In its more figurative sense, the merger of the world of the made and the world of the born. Bionomics will flourish as an academic discipline because as the two worlds merge, economic systems will assume the properties of biological ones.

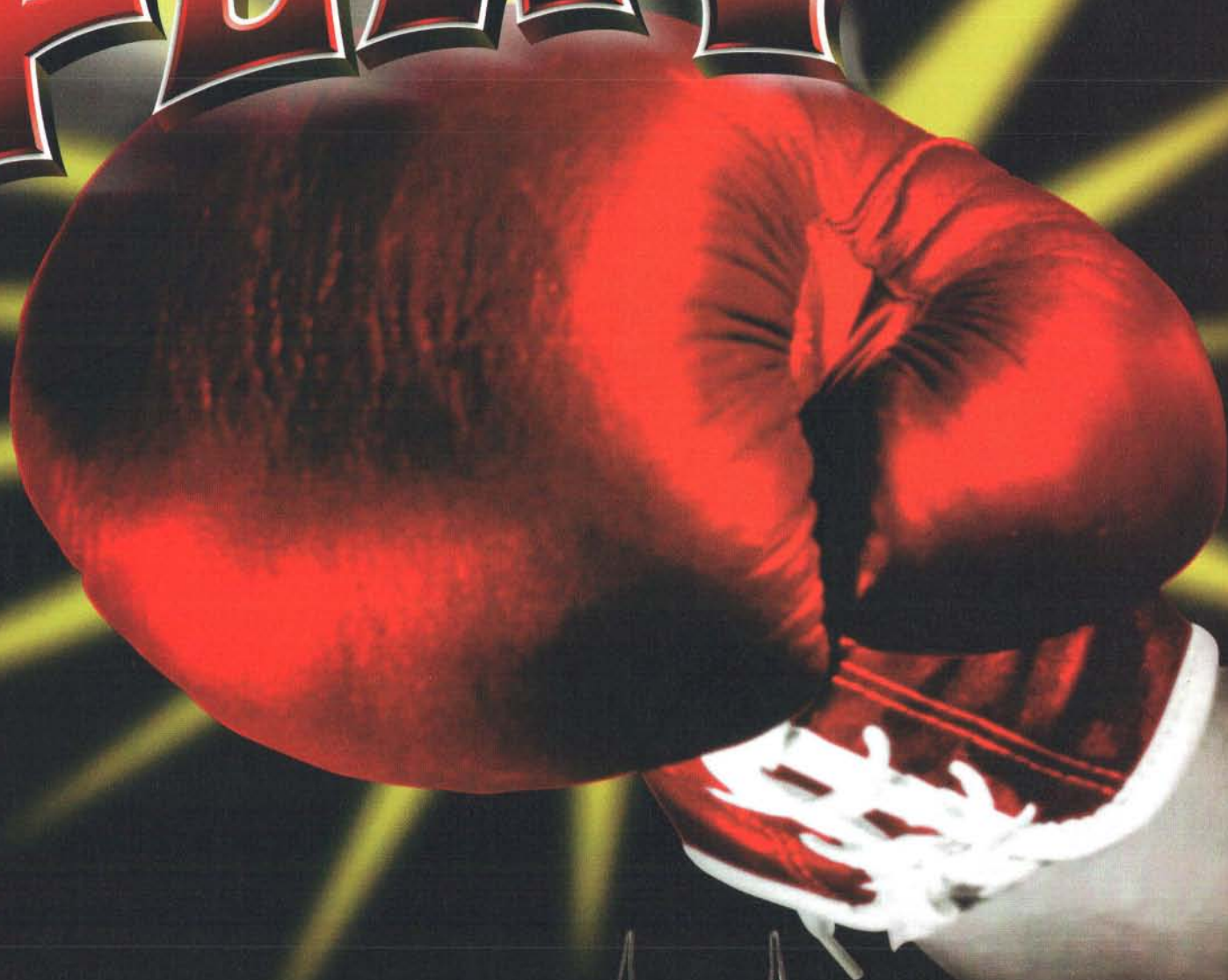
Blue-chip ejaculation The tendency of very large companies when confronted with massive amounts of change to ejaculate a single-point answer in a very large way. See **truncated perspective**.

Capital quarks The subatomic structure of the elemental breeding matter of any business. Capital quarks come in four forms.

From *The 500-Year Delta: What Happens After What Comes Next*, by Jim Taylor and Watts Wacker. Copyright © 1997 by Jim Taylor and Watts Wacker. Reprinted by permission of HarperBusiness, an imprint of HarperCollins Publishers Inc.

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Unruly quarks produce excessive governance, excessive streams of capital, or excessive expectations on the part of the capital market or supplier. Fluid quarks are capital that immediately engages and sustains progress. Venal quarks require the recipient organization to become like the

and in which you must be, not do. "At the still point of the turning world. . . there the dance is," T. S. Eliot wrote in Book I of his *Four Quartets*. "But neither arrest nor movement. And do not call it fixity."

Connectivity The result of the fusion of computing and communications. First

Cryptocentrism The tendency of microcultures to invent language that maintains in-group/out-of-group distinctions.

capital source. Social quarks add social magnificence to the basic philosophical concept. See **pagan capital**.

Competitive uniphobia A fixation on competitive situations that by their very nature are transitory. See **truncated perspective**.

Complicated simplicity What's needed to survive and prosper in a chaos world in which reason no longer applies, in which you must focus on outcome, not process,

posited by Nobel laureate Arno Penzias. See **Age of Access**.

Convergence The blending of culture and ideas into a single product.

Corporate communalism The tendency of executives within any corporation to group within their own think-sets, experience-sets, and product-sets. See **truncated perspective**.

Cryptocentrism The tendency of media

communes, tribes, and other microcultures to invent language that maintains in-group/out-of-group distinctions. Technobabble, gang "signing," and graffiti "tagging" are all examples of cryptocentrism.

Cultural schizophrenia The modern condition born of a disconnection between attitudes and behaviors, between the world as it is presented and the world as we intuit it to be. Cultural schizophrenia occurs whenever society begins to reinvent its vision of how it will conduct affairs in the future.

Customer loyalty The new imperative of marketing. As the marketplace approaches a supersaturation of products – as the power in the marketing equation shifts from product to consumer – brand loyalty disappears. To survive, manufacturers and retailers will have to create unique loyalty relationships with their customers, one customer at a time. See **marketing surplus**.

Disharmonious conjunctions The organizing principle of a chaos world. Nothing can be planned. Nothing happens as part of a



Bruce Robertson, Director of Information Technology and Rodney Rogers, Vice President of Operations, Florida Crystals.

predictable chain of events. Decision making is driven by random convergences. See **oxymoronic future**.

Distention Not inattention, but the refusal to involve oneself in issues that have no relevance over one's life. A necessary survival skill in a chaos-driven world.

Diversity IQ A basic measure of the capacity to survive and prosper in the Age of Access. Diversity IQ is built on the ability to move freely and tolerantly among people of various races, cultures, backgrounds, and beliefs.

Downward nobility The decline in the value of formerly status-laden items and the simultaneous growth in the status value of just being satisfied. Self-affirmation will come by underspending incomes and exercising independence as consumers, not by depending upon objects to establish worth.

Ecomagnetics The creeping tendency of all products to move toward the central values in the culture.

Endotruths Truths known inside, but not outside a culture – whether it's a social, polit-

ical, or economic organization, a tribe, or a media commune. Endotruths usually begin with the nature of the founder of the organization, and they explain why two companies in the same business often have startlingly different corporate cultures. See **exotruths**.

Evolution The transformation of evil from time to time and place to place and at differing rates of evolution, largely as determined by tribes and communes. For the *Mother Jones* media commune, Richard Nixon remains the embodiment of evil more than two decades after he resigned the presidency under the threat of impeachment. For the Republican cocktail-party circuit, Nixon has passed from victim to embarrassment to redemption to radiant political authority. See **global pillory** and **media communalism**.

Exotruths Presumed truths about a culture, whether they are in fact true or false. Exotruths are the myths that frame the social understanding of an organization. They determine its external value and cannot be

disproved even by denying them. The exotruth of Coca-Cola is that the formula for Coke is kept in a safe deep in corporate headquarters; the **endotruth** (see above) is that virtually everybody who is anybody at Coca-Cola knows the formula by heart.

Fault tolerance The capacity of any organization to tolerate calamitous events. Fault tolerance increases in direct relation to an organization's ability to say "thank you" and "I'm sorry."

Filocity A capacity to come up to speed in alien cultures, to make cultural penetration and establish friendships. What Ferris Bueller had in such abundance in the movie named for him.

Flight impulse The tendency of everyone between the ages of 45 and 50 to seek a completely different lifestyle and actively plot their escape.

Fraternities of strangers Ad hoc affinity groups created for finite periods to achieve specific ends. The new basis for social organization. See **tribal marketing**.

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Futopia Statements or ideas about how to live in the future that fail to make reference to or take into account the impending urban population explosion. All speculations about the future that do not factor in large urban crowds are futopic and, thus, futile.

Global pillory Thanks to global access, global connectivity, and global media saturation, global pillory is where you go when you are globally bad. Nearly a decade after he was brought low by the law and despite extensive efforts to raise money for research into prostate cancer, which he suffers from, Michael Milken remains in global pillory, both famous and ostracized.

Glossofacilia A tendency to use very large words to explain very small phenomena. Glossofacilia drives to complexify rather than simplify and is the natural instinct of reactionaries to an age of change.

Herd crimes Crimes that, once committed, are repeated communally, by everyone in the herd. Shoplifting is a herd crime of young teenagers; smoking marijuana was the herd crime of the counterculture of the late '60s and early '70s; padding expense accounts

built around individualism, not consumerism. See **downward nobility**.

Instant history Reinventions of history as a way of accounting for near-term behavior. The marketing of golfer Tiger Woods as a racial icon and Microsoft's introduction of Windows 95 were both examples of instant history at work, but no example better captures the spirit of instant history than the annual NFL Super Bowl. As ex-running back Duane Thomas once put it, "If it's so super, how come they're having one next year?"

Intelligent disobedience What seeing-eye dogs are taught – essentially that they are to obey unless they have a better idea. Intelligent disobedience is already embedded in the corporate culture of companies like Microsoft. See **unrules**.

Latent personalization The unrealized capacity of a product or an idea to be taken personally. Clothing remains the highest per capita commodity expenditure among highly personalized products, but most products, from books to tractors, have a vast potential to be personalized. And in a world of splintering markets and individual

electronic product to consider purchasing.

Macronomia The tendency of large organizations to experience feelings of normlessness and disgust with their own size. Macronomia drives corporations like IBM to partition their parts and decentralize their structures. The cellularity and decentralization, in turn, threaten value continuity in the whole. See **values-based management**.

Marketing surplus A theory developed by McKinsey's David Court, which holds that success is determined not by market share, but by which one of the entities in any transaction – from raw-goods supplier through manufacturer, retailer, and consumer – holds the greatest amount of the surplus or profit made at each step of the process. As the market reaches saturation, marketing surplus moves to the consumer.

Media communalism An affinity group in which members selectively manipulate their media lives to reinforce a singular worldview or set of values. See **truncated perspective**.

Mediocracy The hierarchy formed within microcultures on the basis of media appreciation for the individuals that make up the microculture. New York's Reverend Al Sharpton, to cite one example, has no political base, but has been anointed by the media as the mediocrat for his microculture. Because mediocrats tend to know one another, they are how microcultures communicate with one another.

Mental flexibility The measure of a society's ability to accept change, and perhaps the largest single determinant of national macro-wealth in the future. A 1995 World Bank ranking of future economic potential, based in part on mental flexibility, placed Australia first in the world and the United States fifth.

Multiple yous The capacity to re-create yourself as the situation demands. John Wayne, strong and silent whether he played a cowboy or a soldier, was the paradigm of a loyalty-based world. Tom Hanks shifting from idiot-savant (*Forrest Gump*) to AIDS victim (*Philadelphia*) to hero (*Apollo 13*) is the personality paradigm of a deal-based world.

Nanostalgia The tendency to feel nostalgic over events, such as movies, that concluded

Macronomia The tendency of large organizations to experience feelings of normlessness and disgust with their own size.

is the herd crime of junior executives.

Homophily The tendency of objects, when in close proximity, to assume the characteristics of each other. Based on genetic theory, homophily is equally applicable to human behavior. It increases in direct relation to the increase in access and connectivity. MTV, for example, has created a global homophily of musical tastes among young people, just as television, in general, and VCRs have created a global homophily in wants and desires. The ultimate extension of homophily is a global biological similarity that will threaten genetic variation.

Inconspicuous consumption Defining simply your taste, not your life, by the items you consume. Part of the new economics

realities, realizing latent personalization will become increasingly crucial to market success.

Loss followers Substantive investment in products, without a prospect of recovering the investment, in order to catch up. The extraordinary concession granted by the state of Alabama to attract a new Mercedes plant, the extraordinary expenditures undertaken by the city of Baltimore to attract the Cleveland Browns football team – rechristened the Baltimore Ravens – and Panasonic's heavy investment in a knockoff of the Sony Walkman are all examples of loss followers. In each case, the outlays were necessary to remain credible: as a state to relocate to, a city to invest in, an

only seconds ago. The \$150-a-bottle Krug champagne, for example, celebrates in its advertisements its capacity to deliver nanostalgic moments. **Instant history** (see above) takes advantage of nanostalgia by providing the throttle for such moments. Super Bowl replays are nanostalgic moments in the midst of an instant-history happening.

Non-sense 1. What logic becomes as we cross the delta from reason to chaos. 2.

The indefinable qualities of great brands that enable them to travel across and through time.

Nulture The convergence of nerds and culture, and a powerful, growing force as a majority of the population actively seeks to assimilate and apply advanced technology.

On the bubble As commonly used, a term of great respect. As it should be used, a term of great fear. To be "on the bubble" is to be so close to a trend that your future success is in imminent jeopardy. Why? Because trends move in ever more narrow bands, and the success you presently enjoy is likely to blind you to the changes you must embrace to succeed in the future. When

the capital it delivers is never pagan. See **values-based management**.

Particle economics The economic analog of particle physics, which concerns itself with matter so small that it lacks magnitude yet still exerts attraction and has inertia. A central discipline as capital becomes ever more frictionless, ownership disappears as a measure of wealth, and money comes to lack intrinsic meaning.

Permanent flexibility What all great companies and managers will have – the capacity to constantly remake themselves as different and randomly arising situations demand.

Privacy management Critical in the Age of Access and one of the next great growth sectors. As connectivity spreads, privacy management will become the ultimate status tool.

Real disguise Getting outside the box, adopting a disguise that allows you both to be yourself and to experience life or a situation from a different perspective. The standard work in the field remains John Howard Griffin's *Black Like Me*. See **diversity IQ**.

Shelf determinism The capacity of products

Permanent flexibility The capacity of great companies and managers to constantly remake themselves as different and randomly arising situations demand.

you're on the bubble, it's time to blow your organization up.

Oxymoronic future A future formed by the infinite repetition of **disharmonious conjunctions** (see above).

Pagan capital Capital produced and delivered to a company with one set of values from a capital source with a different set of values. Whether in the form of direct investments or venture capital, pagan capital produces often huge dislocations in entrepreneurial companies, because the values that govern the capital are not commensurate with the values that created the success of the recipient organization. The great success of Warren Buffet's Berkshire Hathaway is directly related to the fact that

to transform themselves on the shelf without any physical changes – a characteristic of all great global brands. Tide, to cite one example, takes on different meanings for differing cultures, but however the culture defines "clean," Tide is its standard of excellence.

Sisbertizing Named for the movie critics Siskel and Ebert, this is the process by which products and ideas are validated within particular microcultures by objective social critics anointed by the microculture to do so. Every microculture has its Sisberts, and it is crucial to appeal to them because, while advertising can create arousal among the microculture, only sisbertizing can create conviction.

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Situa intimacy Intimacy based on proximity, not deep association. The annual Bohemian Grove gathering in California – an exercise in shared nudity among the rich and powerful – is an example of the creation of situa intimacy, as is the US Marine Corps boot camp at Parris Island, South Carolina. Arthur Andersen institutionalized situa intimacy among its trainees by giving them free tickets and encouraging them to get drunk with each other. Situa intimacy can lead to **situational love** (see below).

Situational lifestyles Deal-based, not loyalty-based lifestyles.

Situational love Spasms of affection driven by circumstances that have no binding effect beyond the moment. The intensity of situa intimacy grows in direct proportion to our incapacity to spend emotional capital in the course of our ordinary lives, and as the compression of time intersects with the acceleration of stress, the incapacity to spend such capital in the normal course of events grows exponentially. See **situa intimacy**.

Slinky theory A theory of social history

Unrules A form of corporate discipline built on the premise that in a chaos world the company with the fewest rules wins.

based on the premise that at any given moment society, like a Slinky toy, is either contracting toward consensus or expanding toward the exploration of end points.

Thrival skills Skills that will allow individuals and businesses to not just survive but to thrive in the Age of Possibility.

Tribal marketing The creation of affinity groups for commercial ends. Perhaps the most notable and successful contemporary example is Harley-Davidson, which has coupled the sale of motorcycles and peripherals to the creation of weekend motorcycle clubs and an entire way of life built around Harley-Davidson products. Tribal marketing works best when it is constantly reinforced with icons.

Truncated equilibrium The theory that evolution occurs not as a succession of regularly repeated peaks and valleys, but in huge forward leaps followed by long plateaus. We are currently in the midst of one such leap.

Truncated perspective What happens either individually or within corporations when communalism artificially limits the ability to see things whole.

Unrules A form of corporate discipline built on the premise that in a chaos world the company with the fewest rules wins.

Value stacking How generational values are transmitted. Each generation inherits a stack of values from its predecessors, and each value is subtly transformed as it is stacked and passed on. Value stacking is influenced by the acceleration in the rate of generational change.

Values-based management Management based not on objectives, but on a finite number of incontrovertible beliefs never subject to a proof test. In a chaos-based world in which objectives are constantly overwhelmed by variables, values-based management assures that decisions ulti-

mately arrange themselves to serve the good of the whole.

Vectron An idea or product that pushes a company in a short-wave, relatively insignificant direction, yet is critical to the company's ability to operate on the bleeding fringe.

Wrebels Employees who stray from the inherent values of an organization and thus seek to wreck its value system. If wrebels are important enough, they are sent to **global pillory** (see above).

Xerophilia Not from the Greek root *xero*, meaning "dry," but from the company that turned its dry-copying procedure into a global trademark. The love of copying, and the ability of everything to be copied. ■ ■ ■



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By Nathan Myhrvold

If you can clone a sheep, you can almost certainly clone a human being. Some of the most powerful people in the world have felt compelled to act against this threat: cloning humans is taken to be either a fundamentally evil thing that must be stopped or, at the very least, a complex ethical issue that needs legislation and regulation. But what, exactly, is so bad about it?

If humans have a right to reproduce, what right does society have to limit the means? Essentially all reproduction is done these days with medical help – at delivery, and often before.

With in vitro fertilization, the sperm and egg are combined in the lab and surgically implanted in the womb. The cloning procedure is similar

to IVF. The only difference is that the DNA of sperm and egg would be replaced by DNA from an adult cell. What law or principle – secular, humanist, or religious – says that one combination of genetic material in a flask is OK, but another is not?

Clones already exist. About one in every 1,000 births results in a pair of babies with the same DNA. We know them as identical twins. Scientific studies on such twins – reared together or apart – show that they share many characteristics. Just how many they share is a contentious topic in human biology. But genetic determinism is largely irrelevant to the cloning issue. Despite how many or how few

individual characteristics twins – or other clones – have in common, *they are different people in the most fundamental sense.* They have their own identities, their own thoughts, and their own rights. A person's basic humanity is not governed by how he or she came into this world, or whether somebody else happens to have the same DNA.

Fear of clones is just another form of racism. We all agree it is wrong to discriminate against people based on a set of genetic characteristics known as "race." Calls for a ban on cloning amount to discrimination against people based on another genetic trait – the fact that somebody already has an identical DNA sequence. The most extreme form of discrimination is genocide – seeking to eliminate that which is different. In this case, the genocide is preemptive – clones are so scary that we must eliminate them before they exist with a ban on their creation.

The most upsetting possibility in human cloning isn't superwarriors or dictators. It's that rich people with big egos will clone themselves. The common practice of giving a boy the same name as his father or choosing a family name for a child of either sex reflects our hunger for vicarious immortality. Clones

may resonate with this instinct and cause some people to reproduce this way. So what? Rich and egotistic folks do all sorts of annoying things, and the law is hardly the means with which to try to stop them.

The "deep ethical issues" about cloning mainly boil down to

"Is it possible," asked Justice Antonin Scalia during the Supreme Court's March 19 review of the Communications Decency Act, "that this statute

Pushing Forward, Falling Back

By Andrew L. Shapiro

is unconstitutional today ... but will be constitutional next week.... Or next year or in two years?"

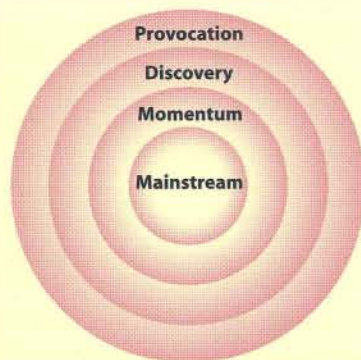
Scalia may have been thinking of the rise of push media, which could indeed undermine the claim that online censorship is unconstitutional. Precedent holds that indecency can be restricted in media that are pervasive and intrusive: "indecent material presented over the airwaves *confronts* the citizen," the Court said in *Pacific*, the 1978 "seven dirty words" case.

Meanwhile, CDA plaintiffs have relied heavily on characterizing the Net as a pull medium. So did the lower court that struck down the law, stating, "Communications over the Internet do not 'invade' an individual's home or appear on one's computer screen unbidden." Not yet. But the day when the Internet is as intrusive as TV or radio may not be not far off. Have push media's marketing-savvy boosters thought about its consequences for free speech?

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"It is modernity which has caused everyday life to degenerate into 'the everyday.'"
– Michel Trebitsch

Peripheral Vision



In a chaos world, it is only by operating at the edge of the extremes – by courting provocation – that managers can break free of truncated perspective. (See "Speak the Future," page 100.)

From *The 500-Year Delta*, by Watts Wacker and Jim Taylor. Copyright © 1997 by Watts Wacker and Jim Taylor. Reprinted by permission of HarperBusiness, an imprint of HarperCollins Publishers Inc.

Practically all the major technological changes since the beginning of industrialization have resulted in unforeseen consequences ... Our very power over nature threatens to become itself a source of power that is out of control ... Choices are posed that are too large, too complex, too important and comprehensive to be safely left to fallible human beings."
— Herman Kahn and Anthony Wiener

jealousy. Economic jealousy is bad enough, and it is a factor here, but the thing that truly drives people crazy is sexual jealousy. Eons of evolution through sexual selection have made the average man or woman insanely jealous of any interloper who gains a reproductive advantage – say, by diddling your spouse. Cloning is less personal than cuckoldry, but it strikes a similar chord: someone has got the reproductive edge on you.

To some, the scientist laboring away to unlock the mysteries of life is a source of evil, never to be trusted. To others, including me, the scientist is the ray of light, illuminating the processes that make the universe work and making us better through that knowledge. Various arguments can be advanced toward either view, but one key statistic is squarely on my side. The vast majority of people, including those who rail against science, owe their very lives to previous medical discoveries. They embody the fruits of science. Don't let the forces of darkness, ignorance, and fear turn us back from research. Instead, let us raise – and yes, even clone – new generations of hapless ingrates, who can whine and rail against the discoveries of the next age.

Nathan Myhrvold is chief technology officer at Microsoft; the full genetic material from which this piece was reproduced can be found at www.slate.com/CriticalMass/197-03-13/CriticalMass.asp. Reprinted with permission. Slate is a trademark of Microsoft Corporation. Copyright 1997. All rights reserved.

For years it's been possible to construct electronic payment systems that are orders of magnitude less vulnerable than checks or credit cards.

Make Them Pay

By Douglas Barnes

Yet MasterCard and Visa get cooperation at the highest levels for systems that are only slightly more secure than leaving money lying on the street. They resist new technology because the cost to them is greater than what they lose in fraud.

Taxpayers, however, get to bankroll all the arresting, prosecuting, and imprisoning – an amazing subsidy for crime essentially created by sloppy protocols. So do we decriminalize payment system abuse? Send AmEx and the others a bill each month? One thing's for sure: as long as the government provides for free what would be unnecessary if companies used better technology, we'll keep getting systems prone to fraud. And we'll all be paying to lock people up on the companies' behalf.

Douglas Barnes, vice president of C2Net, dissects deficient digital commerce as a work-related hobby.

Memes: The Creative Spark

By Liane M. Gabora

Memes, unlike genes, do not come packaged with instructions for their replication; they rely on the pattern-evolving machinery of our brains. We tend to replicate memes that satisfy needs – biological needs like food, shelter, and sex, or needs that contribute less directly to survival of self and progeny. These include the need for love, and the need for a coherent internal model of the world, something we can call upon whenever a situation is too complicated for our hardwired instincts.

This worldview weaves each new instant of experience into its tapestry of associations. Mental censors, however, can disrupt the assimilation of memes that threaten the individual's ego or belief structure. This prevents the brain from forging associations between the new meme and previously stored memes. Conversely, insightful memes sometimes trigger a chain reaction that modifies their host's entire worldview – a conceptual phase shift. Since brains are wired so that related memes trigger one another domino-style, cultural evolution, like biological evolution, has built-in momentum. We control the birth of "our" memes only to the extent that we provide a fertile ground for them to grow and multiply.

The brain's tendency to play with its memes, continually reorganizing and ironing out arbitrary associations to forge more meaningful

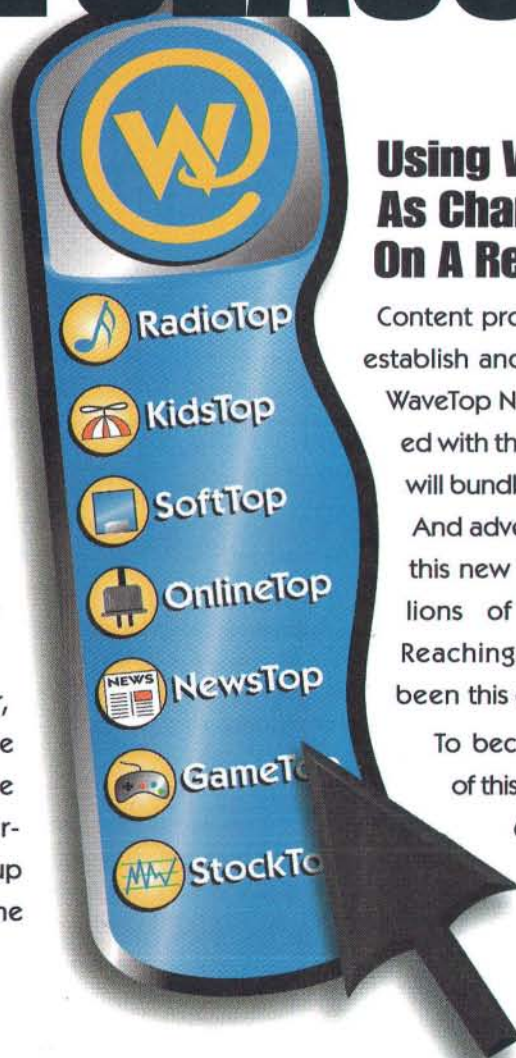
"Superstition is the reservoir of all truths."
— Charles Baudelaire

DON'T MISS OUT ON THE NEW FALL SEASON

WaveTop Network. The Nationwide Broadcast Medium For The Home PC.

This Fall 99% of America will, for the first time, be able to receive *automatically* a wide variety of in-depth entertainment and information channels broadcast directly on their home PCs. They can tune into WaveTop programming with a simple click, just like using a TV remote control. And since WaveTop will be broadcast nationally via data embedded into every PBS TV signal, there'll be no Internet bottlenecks or tying up of telephone lines.

Users can choose news, sports, weather, kids shows, music, games, the latest software and lots more in real time or conveniently save it for future viewing. And the software and service is free to the consumer. The Yankee Group called this new concept in home delivery, "The Ultimate Push Technology."



Using WaveTop Is As Easy As Changing Channels On A Remote Control.

Content providers and software publishers can establish and name their own channels on The WaveTop Network. Channels that can be created with their own look and feel. Leading OEMs will bundle WaveTop into their latest hardware. And advertisers will have a variety of ways on this new medium to reach the potential millions of consumers receiving WaveTop. Reaching the home PC market has never been this easy.

To become a partner and take advantage of this essential and competitive service, call 602-952-5500 and ask for WaveTop. And don't miss the exciting demo on our website at:
www.WaveTop.net

WaveTop

A Service of WavePhore, Inc.™

"Organizations are like fish with people as their cells. They evolved to thrive in the ocean, the high-viscosity world of the industrial age. These fish must now change into fowl to thrive in the zero-viscosity world of the information age. Most of them won't make it. Evolution doesn't work that way."
— Brad Cox

"Sound commercialism is the best test of true value in art. People work hard for their money and if they won't part with it for your product, the chances are that your product hasn't sufficient value.... Genius doesn't starve."
— Berton Braley

ones, often creates unanticipated solutions to pressing problems. This suggests that creativity, the fountainhead of cultural variation, is strategic – not random, as are the variation-generating processes in biology.

Another consequence of meme-play is that knowledge or emotion encoded in one kind of experience can be translated into another kind of experience. The tension produced by censored sexual material, for example, might be diffused in a joke. Or a musician may come to habitually funnel memes encountered in all types of situations – particularly censored material – through brain modules that filter out domain-dependent elements and adapt the core components to the constraints of music. It is in this repackaged format that memes are more fully integrated into their host's memory, and it is through this process that the creator establishes a sense of control over memes that were previously off-limits. Creativity is thus directly or indirectly derived from experience in the world, and since the mathematics underlying this world – the set of all natural functions – is a small subset of all possible functions, the constraints that guide creation are not arbitrary. The drumbeat of a song might echo a heartbeat, and when rhythm and chord progression suggest the sound of someone sobbing, we feel sad.

Memes, as advertisers are well aware, can fool potential hosts into believing they are needed by associating with memes we already identify as necessary. It takes time to degrade these unwarranted associations and assimilate memes that were previously censored – in other words, to mend flaws in the fabric of the individual's worldview. Thus the power of meditative practices: release from the isolating restriction of censors creates a feeling of oneness. Transcending the ego can be taken to mean getting in touch with that part of ourselves that existed before our minds were colonized by memes, often visualized as a spark, halo, or sphere of light.

If each field of knowledge is a pile of sand, the overlapping sandpiles of our era have begun to fuse into one big block. Perhaps the 21st century will see the entire slab of human knowledge stood on its side, and with the help of a new breed of sciences that are not just interdisciplinary but *transdisciplinary*, we will carve slices that run perpendicular to all the traditionally defined disciplines, encompassing part of each. Memetics appears not only to put us on the road to understanding the pervasiveness, diversity, and adaptive complexity of the cultural debris that surrounds and infests us. It also yields unexpected insight into creativity and spiritual matters that have mystified us since the first fledgling memes appeared in our ancestors' brains.

Liane M. Gabora (liane@cs.ucla.edu), a research fellow at UCLA's Center for the Study of the Evolution and Origin of Life, serves on the editorial board of the Journal of Memetics (www.fmb.mmu.ac.uk/jom-emit/). She is working toward putting together an animation/artificial life/motion capture/dance laboratory for applied research into the oldest form of memetic exchange: body language.

When Dan Rather reported in 1986 that he had been beaten by attackers shouting "Kenneth, what's the frequency?" rumors circulated that the assailants had been hired because of the "frequency" with which Rather was allegedly satisfying a television executive's wife.

The word, however, apparently referred to megahertz. William Tager, already serving time for killing an NBC studio hand, recently admitted that he assaulted Rather to learn what frequency the media were using to broadcast into his brain.

The mentally ill have always differed from the rest of humanity only by degree – an unsound mind will translate societal fear into a personal fantasy. So while religious delusions are still widespread in other parts of the world, technologic fantasies now far outpace them in the United States, says psychiatrist Christopher Linskey.

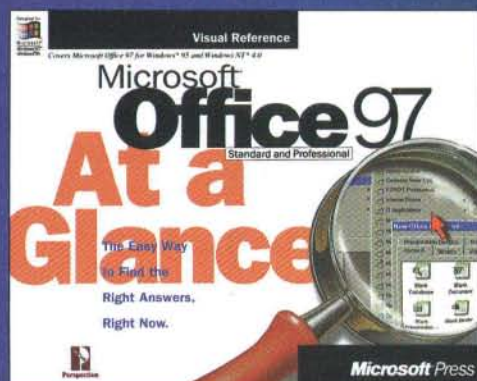
"As American society becomes more technological, our delusions will follow," Linskey says. "Paranoia and grandiosity will remain constant despite cultural changes, but the content will change." Courage.

Bill Brazell tunes in as a copy editor at LAN Times.

The Gates of Heaven

By Bill Brazell

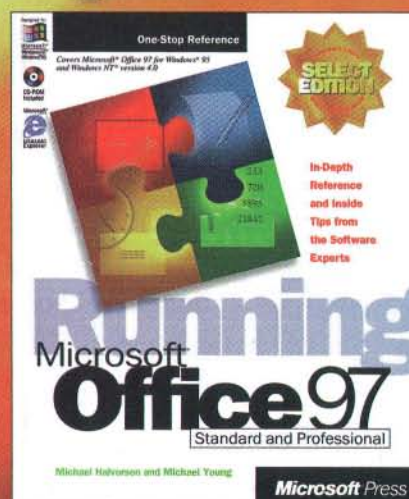
Help



Pub. Price \$16.95
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Whether you're looking for beginners' tips or expert advice on Office 97, Microsoft Press can help. *Microsoft Office 97 At a Glance* offers easy, visual information that quickly helps

you with a particular task. *Running Microsoft Office 97* answers all your questions and provides clear instructions for every Office application. Learn how to get your digital office up and running today with Microsoft Press.



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101 Ways to Save

Apple

Edited by James Daly

Dear Apple,

In the movie *Independence Day*, a PowerBook saves the earth from destruction. Now it's time to return the favor. Unfortunately, even devoted Mac addicts must admit that you look a little beleaguered these days: a confusing product line, little inspiration from the top, software developers fleeing.

But who wants to live in a world without you? Not us. So we surveyed a cross section of hard-core Mac fans and came up with 101 ways to get you back on the path to salvation. We chose not to resort to time travel or regurgitate the same old shoulda/coulda/wouldas (you shoulda licensed your OS in 1987, for instance, or coulda upped your price/performance in 1993).

We don't believe Apple is rotten to the core. Chrysler nearly went under in the late 1970s and came back to lead its industry. Here's a fresh assessment of what can be done to fix your once-great company using the material at hand. Don't wait for a miracle. You have the power to save the world – and yourself.

www.wired.com/5.06/apple/

1. Admit it. You're out of the hardware game.

Outsource your hardware production, or scrap it entirely, to compete more directly with Microsoft without the liability of manufacturing boxes.

2. License the Apple name/technology to appliance manufacturers and build GUIs for every possible device – from washing machines to telephones to WebTV. Have them all use the same communications protocol. Result: you monopolize the market for smart devices/homes.

3. Start pampering independent software vendors. Your future depends on strong, user-friendly software. ISVs are losing confidence and crossing over to the Dark Side to take advantage of Wintel's market share. Remember what happened to OS/2 – not enough applications, updates too late, scarce industry support. And all the marketing dollars IBM threw at it couldn't help. ►





Technologists get so caught up in the bits and bytes that they forget why people use

computers at all. Apple has been a victim of the success of the Macintosh. It made an overcommitment to across-the-board backward compatibility and is suffering from a severe lack of vision. Success has blinded management to more radical alternatives. It never rethinks the whole proposition. Throw out the old and clumsy desktop, along with its operating-system-and-applications paradigm, and go for true task-centered design. Hanging on to the decades-old "look and feel" will keep the old customer base while sacrificing the future. The new software should be platform-independent, making Apple primarily a software supplier and giving the world a superior alternative to Microsoft's Windows.

Jef Raskin, creator of the Mac



Drop that wimpy ad campaign with its effete typeface.

Come out slugging with hard-nosed product comparisons. Possible ad lines:

"Pentium – for the rest of them."
"The fastest laptop in the world!"
"I'm in a great big hurry. Give me the Mac."

Roger Ebert, film critic

4. Gil Amelio should steal a page from Lee Iacocca's book – work for one year without a salary, just to inspire the troops.

5. Straighten out the naming convention. Link model numbers to processor speed. When buying a 3400 laptop computer, what, exactly, are you getting? Unless you study the brochures, you don't know how it compares with its competition. On the other hand, Wintel talks explicitly about processor speed. It's a Pentium 200-MHz box.

6. Apologize. You've let down many devoted users and did not deliver on the promise of the Macintosh platform.

7. Don't disappear from the retail chains. Rent space in a computer store, flood it with Apple products (especially software), staff it with Apple salespeople, and display everything like you're a living, breathing company and not a remote, dusty concept.

8. Buy a song. Last year, it would have been "Respect" by Aretha Franklin. This year, maybe it's "Ain't too Proud to Beg."

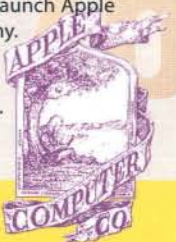
9. Fire the people who forecast product demand. In 1996, you had a million dollars in back orders for the PowerBook 1400, while the warehouses were full of unsold Performas.

10. Get a great image campaign. Let's get some branding (or rebranding) going on. Reproduce the "1984" spot with a 1997 accent.



Wozniak and Jobs finish work on the Apple I – a preassembled computer circuit board that has no keyboard, case, sound, or graphics – and launch Apple Computer Company.

No one notices.



11. Instead of trying to protect your multicolored ass all the time, try looking forward. You've gotten stale by adopting the worst aspects of your competitor's business practices.

12. Build a fire under your ad agency. People don't need warm, fuzzy infomercials about the Mac family. And who cares what's on Todd Rundgren's PowerBook? People want to know about power (the CPU kind, not George Clinton's), performance, and price.

13. Exploit every Wintel user's secret fear that some day they're going to be thrown into a black screen with a blinking C-prompt. Advertise the fact that Mac users never have to rewrite autoexec.bat or sys.ini files.

14. Do something creative with the design of the box and separate yourselves from the pack. The original Macs stood out because of their innovative look. Repeat that. Get the folks at Porsche to design a box. Or Giorgio Giugiaro. Or Philippe Starck. We'd all feel better about shelling out the bucks for a Power Mac 9600 if we could get a tower with leopard spots.

15. Dump (or outsource) the Newton, eMate, digital cameras, and scanners.

16. Take better care of your customers. You need every one. Make customer service a point of pride. Many Mac users feel alienated and have jumped ship.

17. Build some decent applications that the business community will care about.

18. Stop being buttoned-down corporate and appeal to the fanatic feeling that still exists for the Mac. Power Computing's "I'll give up my Mac when they pry it from my stiff, dying fingers" campaign hits the right note. In the tech world, it's still a crusade. Support the Mac community, and the Mac community will support you.

19. Get rid of the cables. Go wireless.

20. Tap the move toward push media by creating a network computer with state-of-the-art technologies, e.g., videogame support for Nintendo 64, top-notch graphics such as QuickDraw 3D, and the best possible bandwidth.

21. Sell yourself to IBM or Motorola, the PowerPC makers. You can become the computer division that Motorola wants or the alternative within IBM. This would give the company volume for its PowerPC devices and leverage for other PowerPC offerings.

22. Create a new kids' computer, an upgradable Wintel-compatible machine, in bright rugged colors that can take stickers and duct tape, and that a young user can call his/her own. This machine has two killer apps: autograding of homework for the teachers; passing notes via wireless for the kids. Price: US\$350 before upgrades.



Wired:

While working as programmers at Atari, Steve Wozniak and Steve Jobs create a blueprint for an easy-to-use personal computer. They offer the idea to their boss, founder Nolan Bushnell.



Tired:

Bushnell turns them down.



The Apple II is introduced at the first West Coast Computer Faire. It is the first personal computer to generate color graphics and includes a built-in keyboard and power supply.



The media pays more attention to other, earlier PC makers, such as Kaypro and Osborne.



Apple Disk II – an inexpensive, user-friendly, and fast floppy drive – debuts, making possible the development of serious software.



Hardly anyone makes applications for it.

23. Create a new logo. The corporate graphic of the multicolored apple was tired in the 1980s, now it's positively obsolete. Plaster the new logo on hats and T-shirts to be worn conspicuously by Andre Agassi, Nicolas Cage, and Ashley Judd.

24. Pay cartoonist Scott Adams \$10 million to have Dilbert fall in love with a Performa repairwoman.

25. Portables, portables, portables. Pick the best-of-breed Wintel

in each of the portable categories and then better it. Wintel has a fantastic range.

26. If you sell it, make it! Stop releasing new products if you can't fulfill the orders. Angering the few loyal customers you still have is no way to do business.

27. Relocate the company to Bangalore and make it cheap, cheap, cheap. (See *Wired* 4.02, page 110.)

28. Don't lose your sense of humor. Build a very large life pre-

server and display it in front of your Cupertino, California, headquarters.

29. Work closely with Hewlett-Packard, Casio, or someone who understands power management. When was the last time anyone got more than 60 minutes out of a PowerBook battery?

30. Reach forward by reaching back. Secure the hearts and wallets of college students through a highly targeted AppleLoan program. ▶



Apple should:
1. Merge with Nintendo – this moves the brand into the consumer space and under one management team.
2. Buy Gateway – out with the cow spots and in with the Apple logo.
3. License Windows 95 and NT – keep the guts of the OS and work exclusively on making the Windows GUI just like the Mac.
Ann Winblad, principal at Hummer Winblad Venture Partners



ORIGINAL SIN.

The Apple Macintosh O.S.

Welcome to Eden.

We didn't create computers but we remade them in our own image so that people could use them and so that they would want to use them.

Over the years the Macintosh operating system has helped millions of people do just that, by providing a simple, intuitive approach that makes all aspects of computing easier.



When we began defining a new software architecture that would take us into the future, we had two clear objectives: to enhance our traditional strengths, and to create an operating system that would transcend the competition, setting standards into the next century.

Eden, the new Macintosh operating system that will leave other operating systems feeling cast out.

Imitated not equaled.

You can learn more about Eden by visiting us at www.eden.apple.com or by calling 800-538-9696 for information by fax.

All Rights Reserved. Apple, the Apple logo and Macintosh are registered trademarks of Apple Computer, Inc.

Rhapsody is far too mushy a name for the new OS. Rename it Eden and create an ad campaign exploiting the belief that Satan resides in Redmond.



Company's first printer, the Silentype, is introduced. Jobs visits Xerox PARC, realizes future is in graphical computing, and grabs it for Apple. Macintosh project begins.

Apple goes public.



The company launches Apple III, its first turkey.

Jobs becomes Apple chair.

IBM releases its first PC; the safe brand name will ultimately allow an inferior technology to dominate the market.



Apple becomes the first PC company to reach US\$1 billion in annual sales.

The company doesn't clone its machines. Meanwhile, more than 100 computer manufacturers churn out IBM PC knockoffs.



Xerox doesn't have a clue.



Adopt, acquire, and create new technologies that can give

Apple yet another technological edge. Such technologies include integrated full-text search in the OS (Apple does have V-Twin), remote diagnostics by phone, Net-oriented automatic software upgrades (like Castanet), and a better/faster/more robust file system.

Bruce Horn, member of original Macintosh development team

31. Build a PDA for less than \$250

that actually does something:

- a) cellular email
- b) 56-channel TV
- c) Internet phone.

32. Advice to Gil Amelio: shorter speeches, tighter pants.

33. Change the visual presentation of marketing/advertising to signal that *real* change is under way. Focus attention (operationally and in marketing

terms) on Apple's concrete growth. Boldly setting the milestones along the path to rebirth and hitting them is the only way to evolve the marketing message that so far has focused on undelivered promises.

34. Port the OS to the Intel platform, with its huge amount of investment in hardware, software, training, and experience. Don't ignore it; co-opt it. Operating systems are dependent on installed base; that is your biggest hurdle now. It is not the head-to-head, feature-set comparison between Windows and Mac OS.

35. Get MkLinux and BeOS to run on PowerBooks.

36. Clone the PowerBook. When the shabbily made 5300s started to fall apart, catch on fire, and explode, a lot of Apple customers were forced to turn to Wintel for laptops. There was no place else to go. If clones had been available, the users might have stayed in the family.

37. Take advantage of NeXT's easy and powerful OpenStep programming tools to entice a new generation of Mac software developers.

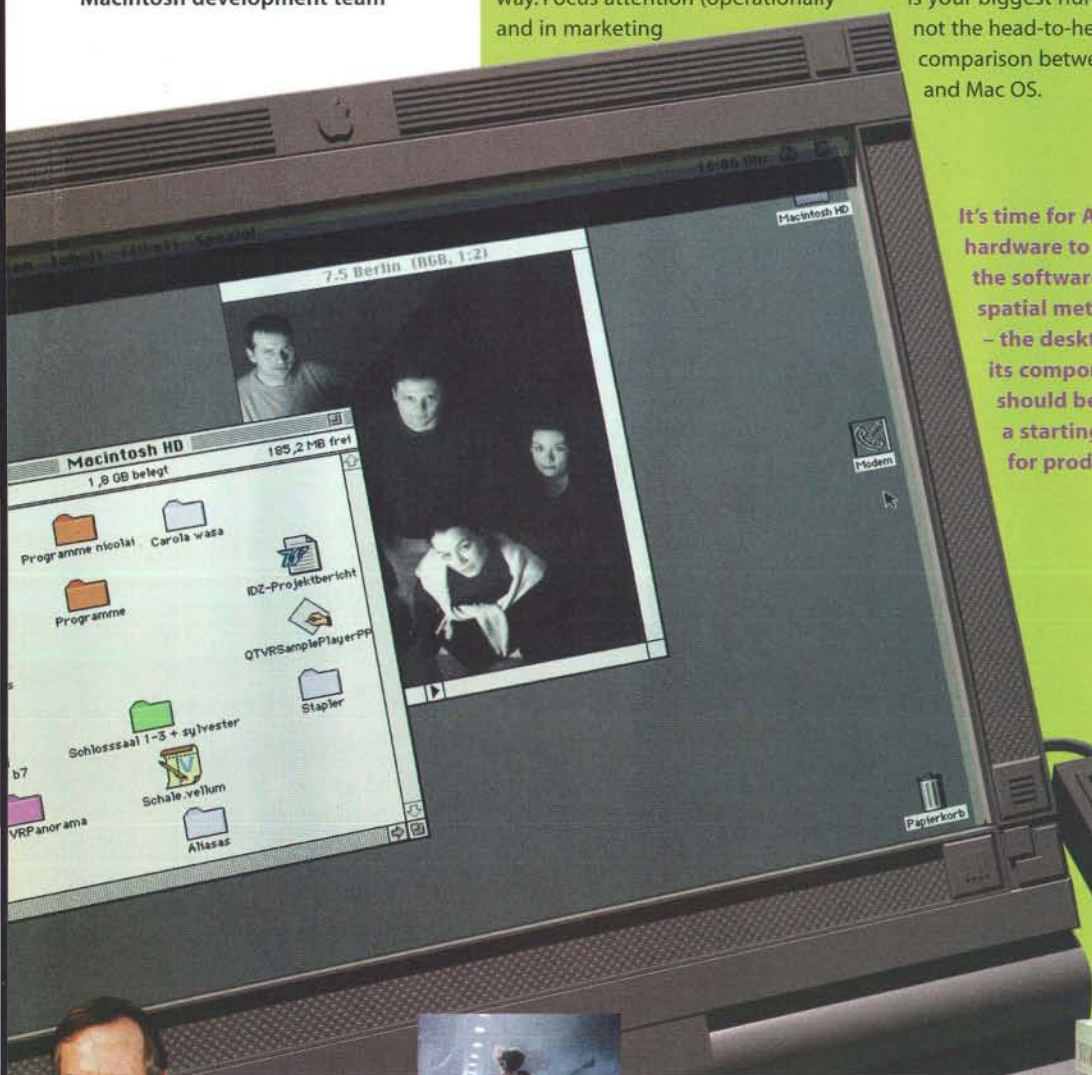
38. Make it easier for ISVs to make applications for both Apple and Wintel environments – if not at the desktop, then certainly at the server. Without these innovations, the only hope is to keep what is left of the installed base.

39. Build a laptop that weighs 2 pounds.

40. Cash in on millennium fever with an ad campaign that portrays Apple as a return to basics, a rediscovery of simplicity and purity, a rejection of complexity.

41. Arrange venture funding for new, cutting-edge multimedia publishers – this is where you shine and where the public will become interested again.

It's time for Apple hardware to extend the software. Your spatial metaphor – the desktop and its components – should be used as a starting point for product design.



Wired:

John Sculley is wooed away from Pepsi to become president/CEO.



Apple unveils the Macintosh and airs the now-legendary "1984" commercial, directed by Ridley Scott, during the third quarter of the Super Bowl.

The Orwellian scene depicts the IBM world being shattered by a new machine.

The commercial is never shown again. Apple fails to successfully push Macintosh to the business market.

The company rolls out the LaserWriter, the original affordable PostScript laser printer, and Aldus releases PageMaker, one of the first desktop publishing programs.

Wozniak resigns. Jobs resigns after failing to oust Sculley in an attempted boardroom coup. Apple lays off 1,200 employees, one-fifth of its workforce, and posts its first quarterly loss. Microsoft introduces Windows 1.0.



Apple debuts the Mac SE and Mac II, which make the Macintosh line a viable, powerful family of computers. The company announces plans to create an independent software company, later known as Claris.

The company ignores suggestions to license its OS.



42. Organize a telethon. Hire Jerry Lewis to get dewy-eyed over the new line of Mac products.

43. Remain committed to the openDVD Consortium, addressing the issues of implementing digital-versatile-disc technology. You've always been a bridge between the entertainment and high tech industries. Maintain it.

44. Continue your research in voice recognition. It's the only way you're going to compete in video-conferencing and remote access.

45. Don't raise the Mac OS licensing fee. Cloners have helped stabilize and even increase market share for the Mac OS; this keeps software developers happy.

46. Stop wasting time on frivolities like Spartacus, the 20th-anniversary Mac. Get over yourself ... at least for a while.

47. Work on ways to make your lower-end models truly upgradeable. Giving customers a definite, manageable upgrade path will attract and hold customers. People need to be able to upgrade and expand, so they don't feel dead-ended every time Apple changes its mind. Upgrading a Ilvx to a Power Mac is theoretically possible, but there are so many hardware and software problems that the experience is enough to turn a nun into a crack-smoking serial killer.

48. Get Ben & Jerry's to name a flavor after you. Suggestion: Apple Silicon Chip Supreme.

49. Bring back Andy Hertzfeld and the other original Mac folks to explain to the executive team that simplicity and design elegance are what made the Mac attractive to developers in the first place and what still makes the Mac unique: automounting diskettes, self-configuration of hardware, direct manipulation of files, free-form filenames with spaces and no three-dot suffixes, uniform user interface across applications.

50. Give Steve Jobs as much authority as he wants in new product development. Let Gil Amelio stick to operations. There's no excitement at the top, and Apple's customers want to feel like they've joined a computer revolution. Even if Jobs fails, he'll do it with guns a-blazin', and we'll be spared this slow water torture that Amelio has subjected us to.

51. Speak to the consumer. Not to the press, not to the competition, but to the people who grew up with the Mac.

52. Return to the heady days of yore by insisting that Steve Jobs regrow his beard.

53. Recharge your strategy for Europe, where the PC market penetration is lower than in the US and the population is educated and interested in high tech. There's an opening there that doesn't exist here.

54. Sell off the laser printer business. Create an auction between HP and Lexmark International. Get Japanese companies into the act. Sell to one that's already making money in the printer business or

to one that makes related products. That way, the buyer is getting increased market share.

55. Give the company that buys the printer business a contract to manufacture printers with the Apple trademark and then put it in your existing distribution system. Selling off the manufacturing assets for printers provides a one-shot infusion of cash that reduces the drain on the balance sheet. You also make a distribution margin on the printers and associated supplies.

56. Stick to your schedule. After canceling the long-awaited Copland, you can't afford to miss even one of your OS deadlines.

57. Bring back John Sculley. He would provide a convenient whipping boy.

58. Create dollar incentives to attract software vendors to write for the upcoming Rhapsody platform. You have cash in the bank – use it.

59. Invest heavily in Newton technology, which is one area where Microsoft can't touch you. Build voice recognition and better gesture recognition into Newton, making a new environment for desktop, laptop, and palmtop Macs. Newton can also be the basis of a new generation of embedded systems, from cash registers to kiosks.

60. Abandon the Mach operating system you just acquired and run Windows NT kernel instead. This would let Mac run existing PC programs. (Microsoft actually has ►



Listen to the great cry that has gone up from the software-development and end-

user community. Online VRML, MIDI development, and 3-D graphics acceleration all rocketed past Apple; many of the most innovative advancements on the Web need to be experienced on a Windows machine to be fully appreciated. As a longtime user of the Mac and an early and vocal fan of its simplicity and power, I find it all a bit sad.
Jim Ludtke, graphic artist



Key question: Why save Apple? It isn't entirely obvious why a company whose man-


agement has done as much destruction to shareholders, employees, vendors, and customers ought to be saved. More to the point, what does *save* really mean? Besides why, we need to consider who and what, in addition to the implied how. Having been flamed – mindlessly and sometimes venomously – by Guy Kawasaki's Mac-addict brown-shirts, I hesitate to make any formal recommendation. However, emboldened perhaps by a glass of adequate merlot, I will offer this utterly hypothetical speculation as grist for lateral thinking: maybe Apple's shareholders should sell what is left of Apple to Steve Jobs's Pixar for, say, \$400 million.


Lewis J. Perelman, president of Kanbrain Institute

 **MacWorld Expo begins.** Apple posts its first billion-dollar quarter.

MACWORLD Expo/Boston
August 10-12, 1989
Program Guide




 The company gets sued by Xerox, which challenges the validity of Apple's graphical user interface copyrights. Apple introduces its first portable Mac. At more than 15 pounds, it's instantly dubbed a "luggable."

 US District Court dismisses most of Xerox's lawsuit against Apple.

 Michael Spindler becomes president of Apple. Spindler, a straight-ahead businessman nicknamed "The Diesel," provides an uninspiring figurehead. Microsoft rolls out Windows 3.0. Apple lays off 400 employees.



 PowerBook introduced; Apple, IBM, and Motorola team up to make PowerPC RISC chips.

 IBM and Apple combine to create Taligent, an ill-conceived and poorly executed attempt to write a new object-oriented operating system.





Apple has always been too proud of its marketing – since

1984 the company has been a vertically integrated advertising agency. So get rid of all the well-dressed charismatic engineers and keep the ones who'll fix the simple things wrong in the Mac OS, like getting quickly and reliably on the Internet. My wife and I think Apple will pull through. We are raising our children on Macintoshes. We just bought them each a new Performa. Of course, we are the lucky ones. We can afford to buy Wintel clunkers – holding our noses – if Apple goes under.

Bob Metcalfe, inventor of Ethernet, founder of 3Com



I'm a Mac lover, but last year I switched

over completely to Windoze because Apple couldn't build a reasonable laptop. I *really* want it to succeed, but I think the company's finished. Software vendors aren't turning out enough code to keep the Mac as a really good platform, even for family and school stuff. This whole NeXT decision seems to be a waste of time. It should have been sold to HP for \$35 per share a year and a half ago. Maybe if Apple caves in, Windows will get so much market share that the Department of Justice will intervene and break up Microsoft. I think Window's competition is really the NC- and WebTV-type box. Which is truly sad.

Milo Medin, president of @Home

Windows NT working on Mac hardware. It also has emulation of Mac programs with NT running on both Power PC and x86.)

61. Ink a promotion/development deal with Shaquille O'Neal; introduce designer Shaqintosh model.

62. Build a computer that doesn't crash.

63. Make Java work on your OS. Then develop an enterprise computing strategy in partnership with Sun. Java is not a magic bullet, but supporting it will keep Mac owners happy and prevent them from looking elsewhere.

64. Team up with Sony, which wants to get into the computer business in a big way – think Sony MacMan.

65. Roll out the Mac Plus again as a hip retro machine. Make it really, really uncool to use whizzy, leading-edge PCs.

66. Get the top systems integrators to push NeXT's WebObjects as the ultimate intranet/Internet development environment. You cornered desktop publishing. What do you think the Web is becoming?! Besides, there's plenty of room in this area for new tools.

67. Tighten the focus on your publishing niche – both print and electronic – and seek to dominate it in every way.

68. Retain your Apple Fellows at all costs. With Don Norman and

Alan Kay recently leaving, there is a serious drain in the Big Think department.

69. Change your name to Snapple and see if you can dupe Quaker Oats into buying you.

70. Simplify your PC product line. Reduce the number of Apple motherboards and the number of distinct Apple system models.

71. Become a graphic design company and dominate your niche the way Sun and Silicon Graphics do.

72. Try the industry-standard serial port plug. RS-422 should be a last resort.

73. Rename the company Papaya and begin an aggressive South Pacific marketing campaign.

74. Solidify the management team. Pushing people out or allowing them to leave does not inspire the remaining troops.

75. Speed sells. Push your advantage on the speed of the processor. This summer, you'll release Macs using 450- and 533-MHz processors. Your lead over Intel will be remarkable. Brag about this. Once the operating system shifts toward the end of this year, the PowerPC will really kick some ass (the OS is a major drag on the processor). Intel is forever marketing the speed of its chips. Make it clear that yours are much faster.

76. Make damn sure that Rhapsody runs on an Intel chip. Write a Windows NT emulator for Rhapsody's Intel version.

77. Lose the cybercafés idea. Geez, what were you thinking?

78. Turn Claris loose so it can do some real damage.

79. Exploit your advantage in the K-12 education market. That's the future. Most students use the computer as a true multimedia tool, and their technological expertise is very sophisticated, especially when compared to the typical business user.

80. Maintain existing loyalty at all costs. Use incentives like free upgrades and stock certificates. Gimmicky? Sure. But it helps create a bond and a religious following.

81. Merge with Sega and become a game company.

82. Give the first Apple made exclusively for Windows a cheeky name (like The Big Apple) and an irresistible industrial design like the 20th-anniversary Macintosh. Introduce it with a mammoth ad campaign that shows the makers of other Windows PCs running for cover, as if they've been fearing Apple's monstrous entry into their market for decades.

83. Develop proprietary programs that run only on Macs. Crow about them.

84. Effectively communicate your game plan to employees, customers, and developers. People need a strong presentation of what's going to happen.

85. Quit making each Mac in a platform-specific case, with plat-

Wired:

Launches consumer-oriented Performa line.

Tired:

Initiates trend toward Macintosh brand confusion.

Apple ships the 10 millionth Mac.



Apple releases the Newton personal digital assistant: great idea, poor execution. Sculley is relieved of his position as CEO, leaving Spindler in charge.



The firm introduces the Power Mac family, the first Macs to be based on the PowerPC chip.

Mac OS is licensed to Power Computing, now the most successful Mac clone maker.

The company has \$1 billion in back orders – and not enough parts to fill them.



Microsoft releases Windows 95, which mimics the Mac GUI better than ever.

form-specific parts. Make *one* case for desktop systems and another for laptops. The case, chassis, and all that stuff needs to be as upgradable as the system software used to be.

86. Organize a very large bake sale – look what cookie sales have done for the Girl Scouts.

87. Price the CPUs to sell. Offer novice users the ability to enter the Mac market at a competitive price point and move up the power curve as their level of sophistication increases. The initial price keeps new buyers away.

88. Acknowledge that there are people with repetitive stress injuries. Why do loyal customers have to go to a weird third-party vendor to get a split keyboard?

89. Create a chemical that cleans the Mac's pale gray plastic – they look cruddy after a year, and normal solutions either don't work or seem like they'll corrode the machine.

90. Design a desktop model – call it La Dolce Vita – with a built-in cappuccino maker (featuring anything but Starbucks – Washington's other great homogenizer).

91. Start a new special projects group led by either Jobs or another passionate and creative designer to create the next "insanely great" technology. This time, focus on rolling the technology into the existing Mac line; make sure developers are inspired and in the loop.

92. With each new Mac, include a CD-ROM that explains the Apple family tree and future plans.

93. Develop a way to program that requires no scripting or coding.

94. Maintain differentiation between Wintel and Apple. Cross-platform means Apple OS on Intel boxes, not just add-ins to Windows. Making the Mac more like Windows, or making all technologies "cross-platform," is a going-out-of-business strategy. Extend and improve the Mac's capabilities to handle Wintel data and emulate Wintel for those applications that require it.

95. Fight back. Stand up for yourself with ads that respond to the negative press. Dispute, in particular, reports that Apple's PC market share has fallen. While this is true, overall Mac OS sales have risen.

96. Partner with Oracle, using its technology for a backend database with your friendly face.

97. Have Pixar make 3001, A Space Odyssey, with HAL replaced by a Mac.

98. Testimonials. Create commercials featuring real-life people in situations where buying a Mac (or switching to a Mac) saved the day.

99. Reincorporate as a nonprofit research foundation. Instead of buying computers, customers would buy memberships, just as they do in the National Geographic Society. They'd receive an Apple computer as part of their membership perks. Dues would be tax-deductible.

Your (eventual) profits would also be tax-exempt, and the foundation could continue its noble battle to keep Microsoft on its toes.

100. Build a second graphics/video product based on the connection with Pixar (and therefore with Disney). Steve Jobs and Michael Eisner should define it.

101. Don't worry. You'll survive. It's Netscape we should really worry about. ■ ■ ■

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Repurpose entirely and sell actual apples – the fruit, that is. It could hybridize in special orchards south of Santa Clara, California, and release Apple 1.0 in time for the fall pie season.
Jon Carroll, newspaper columnist



At a certain critical point – perhaps five years ago – Apple stopped investing time,

effort, brainpower, and money in continuing to make a better product. Instead, it dissipated its energy on everything *but* the Macintosh – on Newton, Sweet Pea, Kaleida, Taligent. Meanwhile, the rest of the world caught up. The last great engineering task accomplished on the Mac was the switch to PowerPC. However, no new features went in. The company that had been the leader in operating systems found that it could no longer write an operating system – Copland was a disaster that never shipped. It had to suffer the ultimate ignominy of buying one outside. The NeXT purchase is too little too late. The Apple of the past was an innovative company that used software and hardware technology together to redefine the way people experienced computing. That Apple is already dead. Very adroit moves might be able to save the brand name. A company with the letters A-P-P-L-E in its name might survive, but it won't be the Apple of yore.


Nathan Myhrvold, chief technology officer at Microsoft




Make a lightweight, portable, palmtop Mac. Ideally, it should be a wearable, with a


private eye screen and some sort of half-keyboard. If Apple can't manufacture this, it could make a deal with another hardware maker. Wearables are the future.


Marvin Minsky, AI pioneer

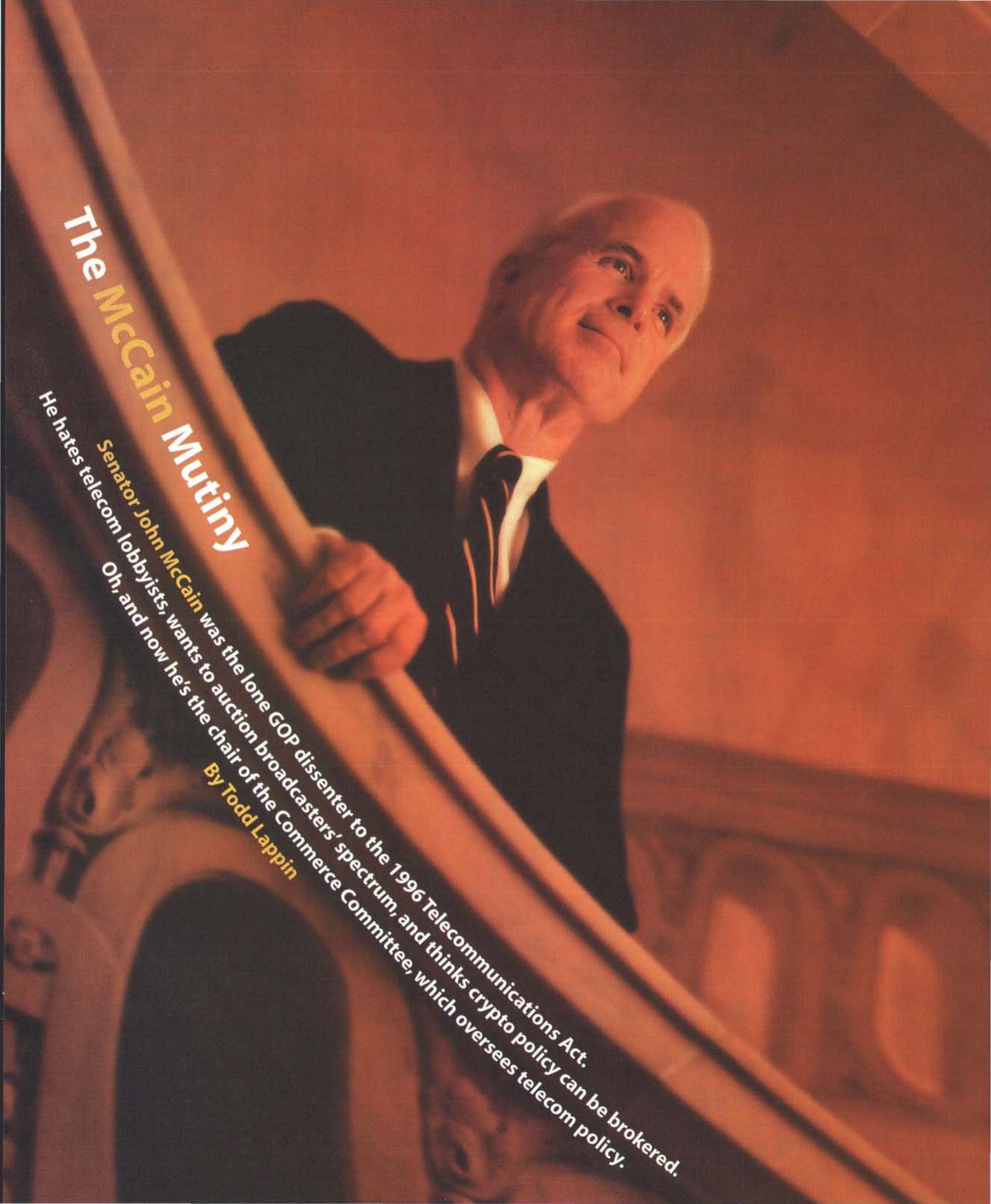
 Mac market share bounces back, thanks to success of clones.



 Jobs is brought back on board as a consultant.

 Spindler is replaced by Gil Amelio, another bland corporate suit. Apple posts staggering \$740 million Q2 loss.

 Apple considers increasing licensing fees. Company lays off 4,100 workers.

A photograph of Senator John McCain, an older man with white hair, wearing a dark suit, white shirt, and a striped tie. He is standing on a grand staircase with ornate metal railings, looking upwards and to the right with a thoughtful expression. The lighting is warm and dramatic, highlighting the textures of the stone and metal.

The McCain Mutiny

He hates telecom lobbyists, wants to auction broadcasters' spectrum, and thinks crypto policy can be brokered. Oh, and now he's the chair of the Commerce Committee, which oversees telecom policy.

By **Todd Lappin**

Wired: What was it about the Telecommunications Act that bothered you so much?

McCain: It was not a deregulatory bill! Three pages of law have been turned into 800 pages of regulation. The bill was an attempt to ensure fair competition by protecting segments of the industry, yet when you have open competition, the consumer is the one who benefits. I saw everybody represented at the negotiating table when we were working on this bill – except for the people who actually own telephones or television sets or subscribe to cable.

Unfortunately, many of the results I foresaw turned out to be reality. Phone rates have gone up. Long distance rates have gone up. Cable rates are going up. Additional costs are being borne by the consumer – which is exactly the opposite of what was predicted. Meanwhile, enormous power has been given over to the FCC.

What do you think of FCC chair Reed Hundt?

I'll say this on his behalf: he warned everybody. He said, "If you pass the bill in this form, I'm going to hire hundreds of people, and I'm going to have to issue thousands of pages of regulations." He wasn't opposed to the idea, but at least he told us what he was going to do. He didn't surprise anyone.

But now that the Telecom Act has become law, what can you do to change it?

The best thing is to hold oversight hearings on various aspects of the legislation. We've already held hearings on the universal-service provisions, and they generated a lot of controversy. We can also educate other senators about the intended results of the legislation – and its unintended consequences. The pressure to change will come from the fact that the legislation failed to achieve its stated objectives – to lower costs for consumers and create a more deregulated environment. But having said that, I don't think Congress will revisit the Telecom Act this year.

You also favor auctioning off spectrum. That hasn't been very popular in Congress.

It would be popular with American taxpayers. We're busy attempting to balance the budget, and by some estimates, we could come up with US\$37 billion of new revenue by auctioning off spectrum.

Spectrum is like a river or a piece of land owned by the American taxpayers, and when someone uses it, the taxpayers should get some benefit. But the broadcasters have been able to frighten people by saying that if they have to pay for spectrum, it will be the end of free over-the-air TV. That simply is not true. The whole thing is ample testimony to the power of the National Association of Broadcasters. It's the most powerful lobby that I've run into, and

it has powerful allies in Congress.

Does it bug you that broadcasters may now use their free spectrum for services other than digital TV?

Yes, it's really disingenuous. But I don't blame them for trying to get the best deal that they can for their industry. That's their job.

How will we break the stalemate between the interests of industry and law enforcement in setting cryptography policy?

It's pretty clear that the administration's crypto proposals will have a harmful effect upon the industry. But we can't completely ignore the warnings we get from the heads of the FBI and the National Security Agency. My next move will be to set up negotiations to see if there is some kind of position we can all agree upon. That makes sense for reasons of practicality, and not just as a tactical move. If the president of the United States vetoes a crypto bill we pass, I doubt we'll be able to override his veto. We need to find a middle ground.

What does that middle ground look like?

I can't say yet, because I honestly don't know what it is.

Do you think that the government should be in the business of regulating online speech?

I have to tell you – I worry about that. My children occasionally visit chat rooms, and all the obscenity is disturbing. Endless strings of obscenity are not enlightening or uplifting at all. I'd like to restrain it. I'd like to punch in the nose the guy who keeps writing four-letter words – first, because he's an idiot, and second, because I think it's so gross. But at the same time, I do not want to infringe on people's constitutional rights.

How familiar are you with the Net?

Not nearly as much as I should be. I barely know how to use it – and I emphasize *barely*.

Then who are you? How would you introduce yourself to the technology community?

I'll admit that I'm abysmally ignorant about a lot of high tech issues, but I'm doing everything I can to understand this industry.

To state the obvious: telecommunications is the future of America's economy, and I come at it with a commitment to the principles of a deregulated, free-market economy. Congress, in my view, should get out of the way. ■ ■ ■

In Washington, Senator John McCain has become a nightmare incarnate for telco lobbyists and broadcast barons. A former US Navy fighter pilot who spent more than five years as a POW in North Vietnam, the hard-nosed Arizona Republican staunchly supports auctioning spectrum airwaves to the highest bidder and radically deregulating the telecommunications industry. In 1996, he was the only Senate Republican to vote against the Telecommunications Act, complaining that the bill preserves existing TV, cable, and telephone oligopolies by imposing a new regulatory framework just as cumbersome as the 1930s-era structure it replaced. McCain's dissent seemed futile until last November, when Senator Larry Pressler (R-South Dakota) suffered an election defeat that left McCain next in line to serve as chair of the mighty Senate Commerce Committee. *Wired* spoke with McCain to find out what may happen now that last year's gadfly has emerged as Capitol Hill's newest telecom powerbroker.

Todd Lappin (telstar@wired.com) is a section editor at Wired.



Director: Mark Dippé
Studio: New Line Cinema
Estimated cost: \$43 million
f/x: Industrial Light & Magic

BY PAULA PARISI

www.wired.com/5.06/summermovies/

F/XTRAVAGANZAS

PREVIEW OF THIS SUMMER'S BIG SPECIAL EFFECTS MOVIES.

It's no secret that big-screen blockbusters are fixated on special effects. It's not so much that character development and plot twists disappear in the summer as that they're drowned out by the big bang. The only thing that really matters is the f/x.

This year is no different, except that high-concept pictures have gone even higher tech. Here's a behind-the-screens look at the season's visual spectacles, where millions in computer-generated and animatronic imagery flash by in the blink of an eye.

Hollywood Reporter writer Paula Parisi (pparisi@aol.com) cowrote "Beyond Star Wars" in Wired 5.02.

With its mutating characters and epic struggle between good and evil, Todd McFarlane's comic *Spawn* was begging for the big screen. And who better to flesh out its promise than two of the guys who created the trailblazing T-1000 in *Terminator 2: Industrial Light & Magic's* Steve Williams and Mark Dippé, here in his directing debut.

In one memorable scene, the Clown (John Leguizamo) transmutes into his hellish alter ego, the Violator. Morphing the 4-foot-6 Clown into a towering 12-foot-tall reptile required a more complicated version of the animation program developed for *T2*. The combatants began their lives as a "chain" – a skeleton built using SoftImage. Onto that was placed a skin "shell," created using Alias. The chain was manipulated to deliver realistic motion, the shell shaded and rendered to create a convincing surface. The synthesesians were then animated using SoftImage and a custom code called Cari that allows shapes to be built on the fly.

ILM created natural body movement by using SoftImage's inverse kinematics then adding custom code that allowed for changes in the underlying bone structure. The finished creatures each have about four times as many control vertices as the molten metal man in *T2*. With the skin and motion perfected, animators then used Renderman to apply lighting and shading.

Director of animation Williams says cinematic software is closing in on bitstream biology, with programs that ever more accurately replicate organic tissue: "Everything has been surface-based. In *T2* we began experimenting beneath a character's surface. Now we look to copy nature's artwork." ■ ■ ■

SPAWN

Boasting a US\$150 million budget that lives up to its name, it's no surprise that director James Cameron's *Titanic* features some of the most spectacular special effects ever put on the big screen. Cameron shot outdoor action sequences on the decks of a life-size model of the ill-fated luxury liner – 750 feet

long and six stories high – which he eventually broke in half so he could film the sinking bow.

One of the biggest challenges, however, was a shot that depicts the vessel's rapid underwater descent. That was left to a computer simulation designed by Cameron and *Titanic* expert Ken Marschall,

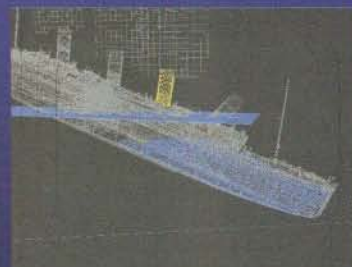
then executed by visual effects supervisor Rob Legato of Digital Domain. The scene, which comes in the first 15 minutes of the film, revolves around the efforts of a modern-day *Titanic* treasure hunter.

The 90-second sequence, created with Windows NT using LightWave software, appears first as a display

TITANIC



Director: James Cameron
Studio: Paramount Pictures/
 20th Century Fox
Estimated cost: \$150 million+
f/x: Digital Domain

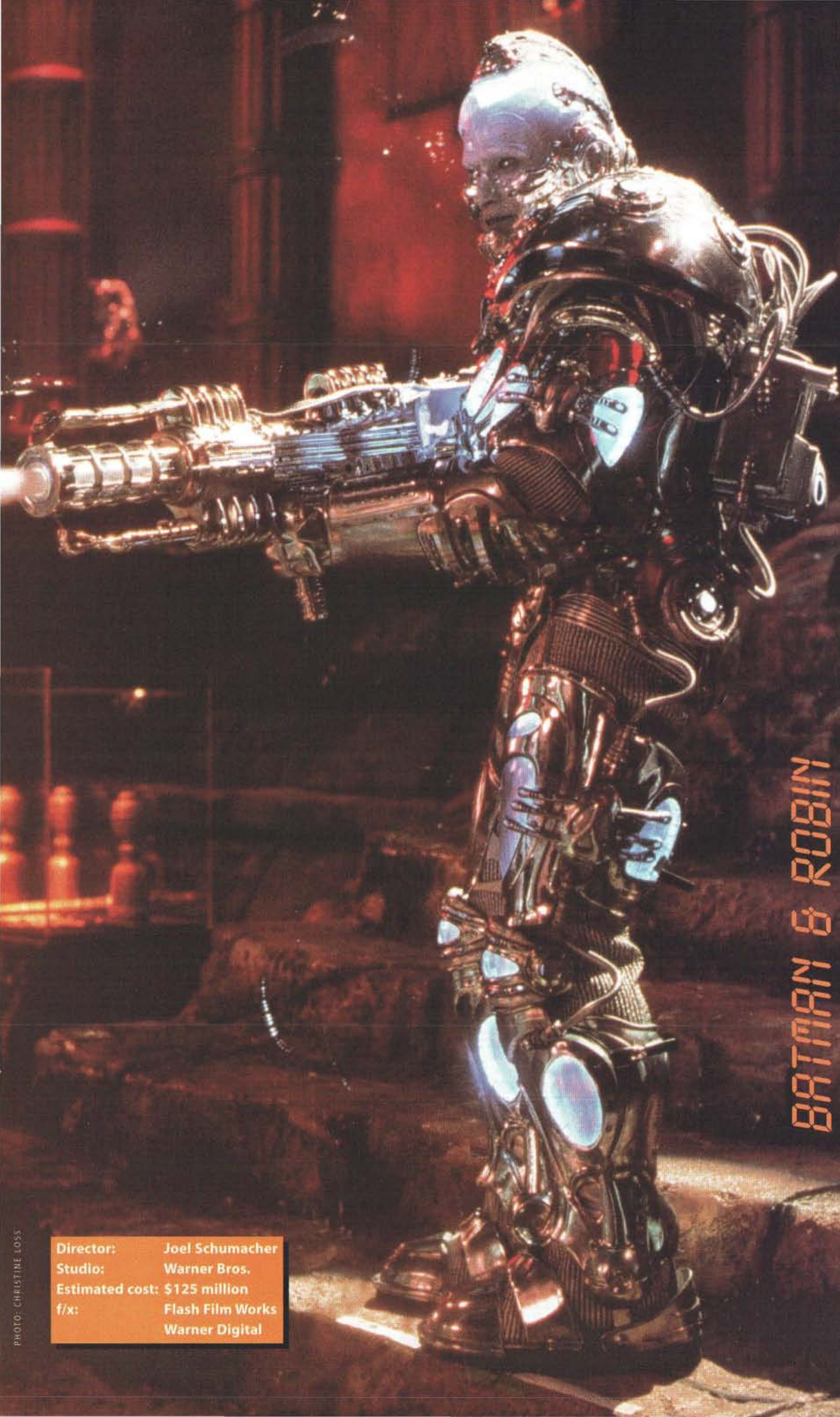


on a computer monitor, then is enlarged to fill the entire movie screen. "As the ship sinks, it tilts, and the stern rises out of the water, higher and higher in the frame," explains Legato. "Jim didn't have us build what would have been beneath the water line

– the propellers and the rest of the hull and all that. All that will be added digitally, and you'll never be able to tell the difference."

Later, when the simulation shows the ship's funnels breaking off, a voice-over explains that the massive cylinders functioned like

a giant toilet flush, sucking in everything, including people. "Every other *Titanic* film depicts the sinking as this kind of polite disaster," Legato notes. "By the time you finish seeing this movie, you'll know what a truly horrible evening it was." ■ ■ ■



BATMAN & ROBIN

Holy icicles! Who's that bringing the big chill to the rooftops of Gotham, with the Caped Crusader and Boy Wonder in hot pursuit? It's the epitome of sangfroid, Mr. Freeze (Arnold Schwarzenegger).

In addition to its fresh crop of villains and a variety of innovative Bat vehicles, *Batman & Robin* features some cool new weaponry, including the megawatt Freeze Ray. The, er, firearm is essentially a prop effect, its frosty spew generated by computer and painted onto each frame, explains visual effects supervisor John Dykstra. "You have to track the original live action, match the perspective of the gun, and duplicate the camera move from the overall scene, if there was one. In this film, there were lots of them. The camera was rarely stationary."

In this case, a computer-generated light beam was synchronized with CO₂ vapor bursts emitted by the gun on the set, where director of photography Stephen Goldblatt anchored the illusion with "reactive lighting" that riddled the area as if the ray were present. The digital "beam overlay" had several elements, including a core ("similar to the vapor emerging from the mouth of the gun"), a surround ("a spiral of energy"), and a bright pulse that runs down the beam. No mean feat when you consider that the coldhearted criminal is not slow on the trigger (these ice attacks figure into some 40 shots). Suffice it to say Freeze's victims chill out. ■ ■ ■

Director: Joel Schumacher
Studio: Warner Bros.
Estimated cost: \$125 million
f/x: Flash Film Works
Warner Digital

How do you film a massive flying saucer that crashes through a giant globe and then plows into the earth? For Eric Brevig, visual effects supervisor for *Men in Black*, it involved a mélange of effects, ranging from leading-edge computer graphics to tricks that have been

around as long as the movies.

The scene takes place in Flushing Meadows Corona Park, Queens, the site of the 1964 World's Fair. Shot down by Tommy Lee Jones and Will Smith, the spacecraft smashes through the fair's signature unisphere before skidding toward our



40878 IN 1150

heroes at about 200 mph. "We're talking," Brevig says, "about something the size of the *Queen Mary*."

The saucer, which appears to be 20 yards wide in the film, was actually a 9-foot steel model, filmed on a soundstage by Industrial Light & Magic north of San Francisco. Three small unispheres, each 12 feet in diameter, were also built. "The first one was sacrificial," Brevig explains. "We wanted to smash it and study how it came apart, where the pieces flew, and

what was left. Then we brought out the nice-looking ones and shot the scene for real."

The saucer was attached to a vertical pole and mounted on a guide rail running beneath the set. As the vessel shot along the track and crashed through the sphere, the pole tripped switches setting off pyrotechnics that make the ship appear to be burning. The saucer moved at a real speed of roughly 30 mph – "frightfully fast on a 100-foot soundstage," Brevig says.

Director: Barry Sonnenfeld
Studio: Columbia Pictures
Estimated cost: \$80 million
f/x: Industrial Light & Magic

Once filming was done, an f/x expert took charge, digitally erasing the poles and rigs holding the saucer. The actors were positioned in the final composite, a layering process also done on the computer. Fine-tuning included filming some dust elements against a black background, which were then composited into the shot, appearing to wrap around the actors. "It's little touches like that," Brevig notes, "that will make it look like it all happened for real!" ■ ■ ■

Director: Luis Llosa
Studio: Columbia Pictures
Estimated cost: \$50 million
f/x: Sony Pictures Imageworks
Edge Innovations



ANACONDA

When animatronics whiz Walt Conti did his first design for *Anaconda*, the snake was too cute. Real anacondas, it seems, have big, adorable eyes – the better to see you with in the water. So Conti & Co. at Edge Innovations incorporated fiercer features from other snakes for a suitably savage appearance.

The film stars a 1,500-pound, 25-foot warrior snake and a larger 40-foot queen, which weighs 3,000 pounds. Each boasts urethane skin with 60,000 scales, while the mechanized inner workings contain 140 joints and roughly 40 miles of wiring – all driven by 250-horsepower hydraulic units.

"Snakes have the ability to move very slowly and then suddenly give quick bursts of speed," Conti says. To that end, the main movements were controlled by a computer system equivalent to 300 PCs running 200-Mhz processors while puppeteers on the set used joysticks to fine-tune the action.

Scenes that required slithering a considerable distance, wrapping around a person, or twisting in the air relied on digital serpents created by Sony Pictures Imageworks. "The close-ups and a lot of shorter cuts were Walt's snake," says Imageworks CG supervisor John McLaughlin.

"But when you see a full-body snake, or when it interacted very closely with humans – say, squeezing or eating them – it was the CG snake." Silicon Graphics boxes spawned the digital reptiles, primarily using Alias software. The biggest feat for the computer jocks was pulling off extended interaction between CG snakes and real actors. "It's been done before," Conti says, "but not at this level." ■ ■ ■

Talk with Paula Parisi live
Wednesday, June 4, at 6 p.m.
PDT in the Wired Talk room at
www.talk.com/.

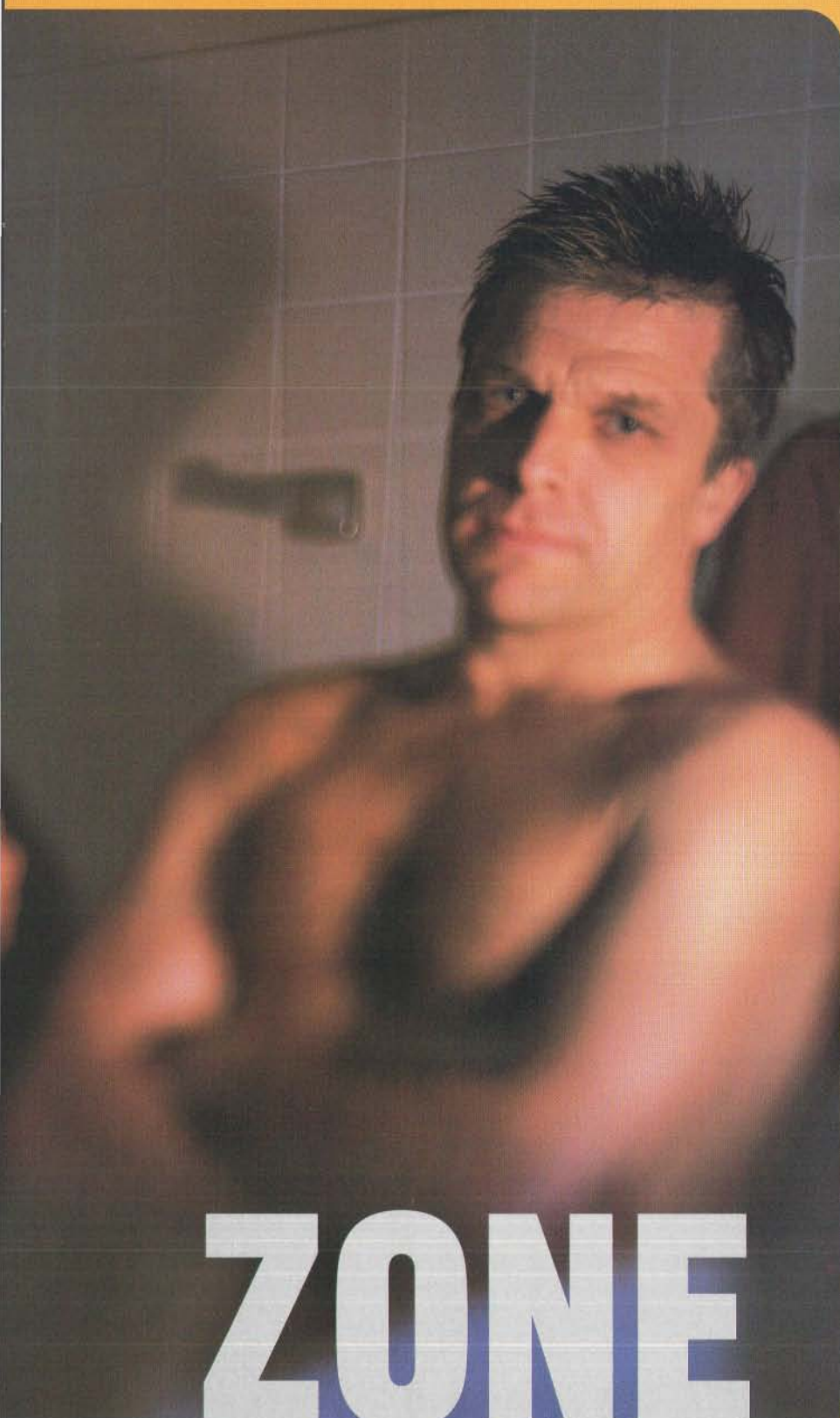


IN THE

They could have been recruited in the gyms of the best engineering schools.

The technojobs at Starwave have created a unique culture –

**Left to right: Patrick Naughton, president and CTO of Starwave;
Tom Phillips, president of joint ventures;
and Mike Slade, chair and CEO.**



ZONE

and made ESPN[®] SportsZone the Number One destination site on the Web.

With Disney as their new investor, they're poised for their highest score.

By David Diamond

Photographs by Rex Rystedt

How's the song go? *"That ain't working, that's the way you do it ..."*

Robert Temple was playing ice hockey with his boss and drinking Henry Weinhard's on tap eight hours ago. Now he's sitting at a terminal piled high with LEGO and superhero playthings, showing me where Barry Bonds is likely to hit the ball if he's up against a left-handed pitcher in a losing game at 3Com Park. Oh yeah, and with the count in his favor. There's a virtual ball field on the screen with dots - lots of dots - for the fair balls Bonds hit in 1995 and 1996: Red dots for grounders. Black ones for line drives. Blue ones for fly balls.

You want just home runs? No problem. Temple, in shorts and a hockey shirt, gym bag at his feet, hits a couple of keys, and the dots vanish - except for a clump of red ones out in left field. It's just the kind of addictive feature that might push a garden-variety online sports fan over the edge and into 12-step territory. Temple wrote the Java applet that makes it happen.

A little over 40 minutes ago, Todd Greene was stealing rebounds from his boss at the Seattle Athletic Club gym. Now he's parked at his computer, trying to settle an owners' dispute in Fantasy Basketball, ESPN[®] SportsZone's automated online version of rotisserie baseball - do-it-yourself dream teams.

Young, bald, and

carrying what looks like about 2 percent body fat, Greene is editing a report to the fictional league commissioner. When he comes across a particularly funny

line, he shouts it out to the rest of the Fantasy League backroom crew – a couple of guys *with* hair, still wet from the postgame shower – and high fives fly. For franchise owners (it costs US\$30 a season to join or \$20 annually for SportsZone subscribers) who screw up and pick loser rosters, these guys have a policy: sure, you can get your money back – if you cry over the phone.

Forty-one-year-old Tom Phillips was born to run, which is what he's doing right now, up a pine-tree-covered hill outside Bellevue, Washington, in the middle of an otherwise busy weekday afternoon. Without missing a breath, he's explaining the rationale behind online sports: "Numbers are the language of sports. Pre-Internet, no medium offered sports data the way fans want it, need it, and demand it."

Phillips is president of joint ventures at Starwave Corporation, SportsZone's co-owner with ESPN, the TV sports giant. As part of his job, he trains a company team for the Hood To Coast relay and leads a weekly noontime Ultimate Frisbee match (this is granola-fueled Seattle, after all). Like many of his colleagues, he's a New York refugee who still gets pumped about the rich texture of life beyond the Hudson – conducting business in running shorts,

and the little entertainment company whose other properties include Mickey Mouse – it's a screaming success, one of the few nonsex sites with users rabid enough to actually pay hard cash (a dollar a day, \$4.95 a month, or \$39.95 a year) to log on to SportsZone Premium, a grab bag of special features. And for the techno-jocks who make it happen, it's a 24-7 world: tough athletic competition one minute, nail-biting deadline sports coverage and mind-scrambling technology immersion the next – Web publishing as a contact sport.

Sports as technology, technology as sport: SportsZone is pushing *two* envelopes. It's about a content machine that's designed to be equally accessible – transparent, in software-jock lingo – to no-tech sports-nut editors and users alike. It's about databases loaded with literally every stat anyone's ever thought of – in virtually real time. It's about engineering that eschews vanilla HTML for dynamic objects and custom push channels. It's about maniacal fans, from South Bend, Indiana, or the South Pole. It's about killer execution meets dream content. And it's about having the time of your life helping other people have fun.

SportsZone shares its Bellevue headquarters with the rest of Starwave's ambitious Web lineup – Family

Sports as technology, technology as sport: SportsZone is pushing two envelopes information machine geared to no-tech sports-nut editors and users alike.

for example. But he can also do the corporate rap as easily as he runs a 5:20 mile: "SportsZone gives you up-to-the-minute data and the ability to analyze it every which way," he says during a break to point at the bank of clouds where the Olympic Mountains should be visible, maybe five months from now. "Millions of people who love sports are wondering how they lived without it."

Jock itch is an occupational hazard at SportsZone, home-cum-locker room of the reigning heavyweight champs of online sports. On a good day – say, a busy college football weekend or anytime during the NCAA Final Four – with hits pouring in by the millions, SportsZone's not just the world's busiest sports Web site. It's the Net's busiest destination, period, trashing all but the two or three top search engines and navigation sites.

For fans, it's the place to go for instant scores, live audio cybercasts, and video highlights, to read about Dennis Rodman's latest herpes lawsuit, or to dork around with stats on Frank Thomas's batting average against Roger Clemens. For its owners – the world's richest sports nut, Microsoft cofounder Paul Allen,

Planet, Outside Online (a joint venture with *Outside* magazine), the Hollywood-geared Mr. Showbiz, and the recently launched CelebSite. The building is part of a nondescript free-way-side office park, but any resemblance to the usual high tech warren ends at the door. There's Foosball in the lobby, Gatorade in the kitchen, after-hours foul-shot contests – even a couple of women among the 30 programmers, producers, and editors.

The stereotypical Web developer's office tends to black clothes and body piercings; here gym bags, sweaty towels, and antifungal cream are part of the decor. It's a place where potential career detonators – this actually happened – include getting caught using somebody else's towel in the on-site locker room. "We tend to hire to a type," says Starwave chair and CEO Mike Slade. "A lot of people come here from the work-really-hard-then-burn-it-off school."

Some of the lineup comes with big names as well,

Kentfield, California-based contributing writer David Diamond (ddiamond@well.com) wrote "The Fast American Hero" in *Wired* 4.11.

It's about killer



It's about an

It's about databases loaded with every stat ever kept.

execution meets dream content. And it's about having the time of your life doing it.



especially by Web start-up standards. Slade, a former newspaper sportswriter, came from Microsoft, where he was product manager for Excel. In his New York incarnation, Phillips was the founding publisher of *Spy* magazine. Starwave president and CTO Patrick Naughton, who can whack a hockey puck with semipro power and grace, was one of the key players behind the development of Sun Microsystems' Java. With 300 employees, Starwave is small enough that all three execs can split their time between SportsZone and the smaller sites.

It doesn't hurt, of course, to have a billionaire proprietor – especially one who can lend his regulation-size indoor home basketball court for Monday-night intramural games. (Allen has another court in Portland, Oregon; his NBA Trail Blazers play there.) And if that's not enough, there's also SportsZone's co-owner, ESPN, the pioneering all-sports TV network. Based in Bristol, Connecticut – and already a Disney property – the cable giant brings veteran commentators, solid relations with athletes, brand credibility, and ad-sales help. Not to mention an audience of 71 million.

What that adds up to is the muscle, financial and otherwise, that has let Slade & Co. build an engineering powerhouse – SportsZone's core idea from day one in April 1995. The site's heart is Bulldog, a custom-built in-house publishing tool that parses data from 15 simultaneous wire feeds, assembling it into thousands of carefully crafted software objects – by team, by player, by statistical category – that are continuously updated in as near to real time as the feeds allow.

It's a torrent of information second only to Wall Street's staggering output: Major League Baseball, the NBA, the NFL, the NHL, and NASCAR, pro tennis, and golf. Plus dozens of lesser sports entities (whose fans, needless to say, don't see it that way), including Major League Soccer, the Canadian Football League, the International Hockey League, the East Coast Hockey League, American Association Baseball, Texas League Baseball, and on down the list.

"We're dealing with hundreds of millions of pieces of live data," explains Naughton, who split his chin twice on 168 ►

Breeding Edge

Steven Rooke breeds these fantastical Tolkien-esque landscapes – literally.

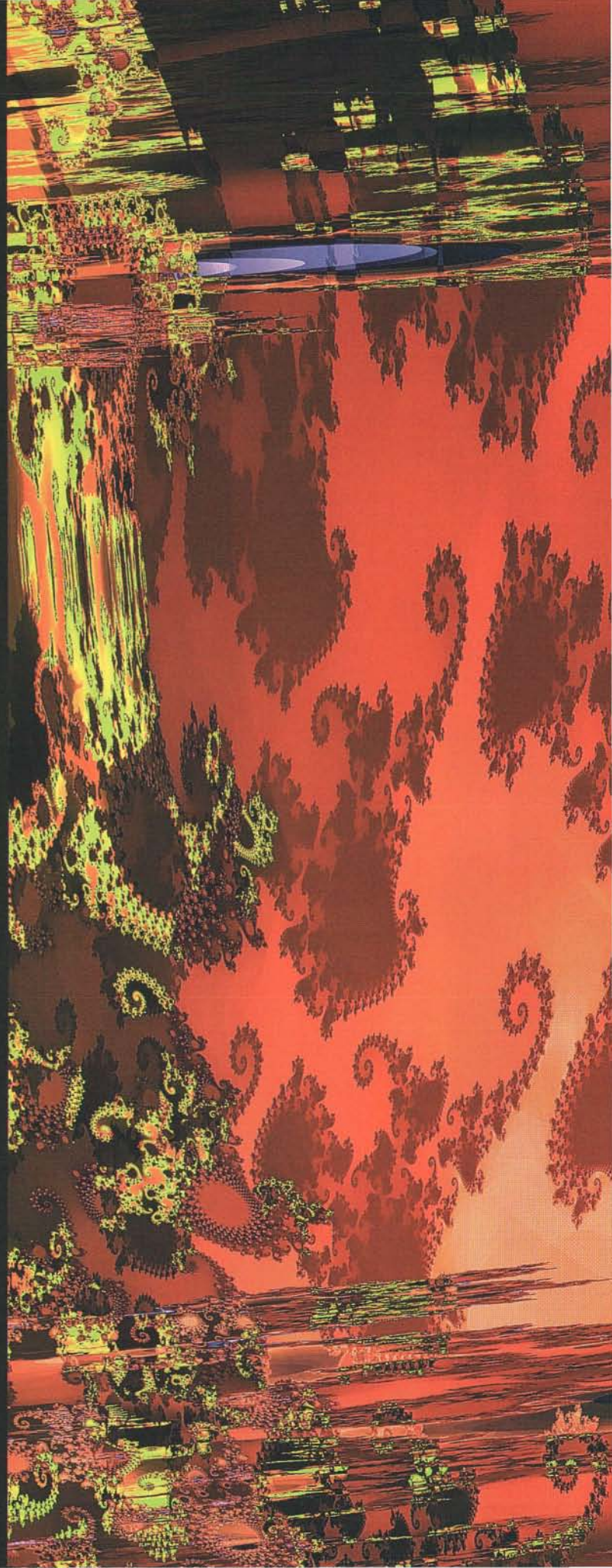
Inspired by Karl Sims and Richard Dawkins, Rooke models his computer-simulated art on the evolution of life itself. Toolled up with a superfast Silicon Graphics Indigo2 and his own genetic algorithms, he creates a population of around 100 images on his computer.

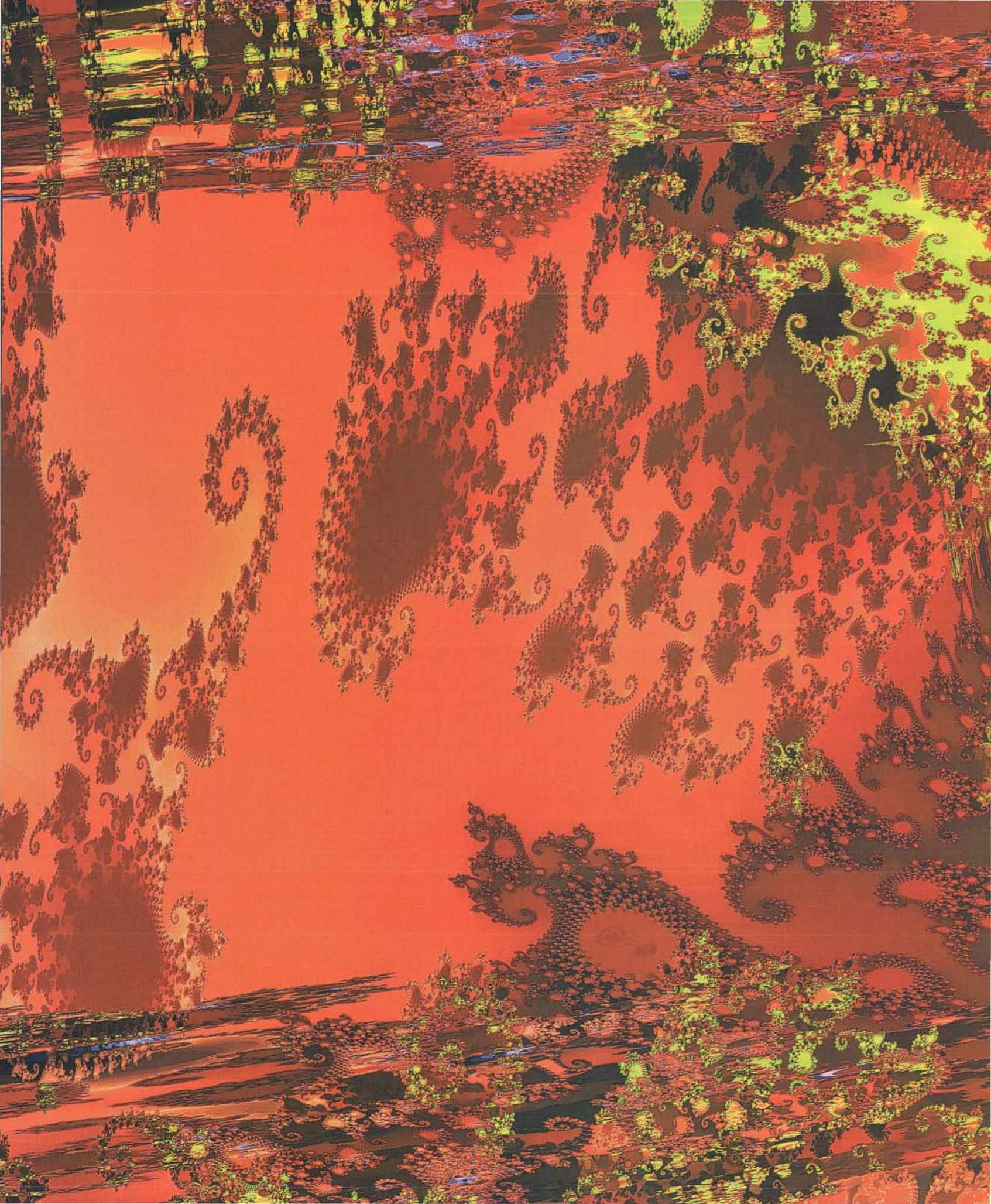
"I examine each image and assign it an aesthetic fitness score." Then, explains the former geologist, "I command the population to spawn." After a flurry of sexual activity, a mosaic of images begins to fill the screen.

You could say it's art imitating life in the purest sense.

Shown here is *Hanging Gardens of Lorien*, and you can experience more of Rooke's Cambrian explosions at www.concentric.net/~Srooke/.
– Jackie Bennion

Jackie Bennion is assistant managing editor at *Wired*.





Wired: Following the success of your single, the media have been quick to portray you as a stereotypical computer geek. Are you?

Mishra: I would say I'm a geek but not in the English way. English people don't understand what it means. To me, a geek is anyone who has a passion for what they do, yet in Britain the term is only ever associated with technology. In America you can be a geek in anything from horse riding to pottery.

Do you think the British press is still ignorant about technology?

Very. What gets to me is that the papers won't refer to

Sting – who plays the double bass – as a PC nerd, even though he uses far more technology than I do. Forget the fact that the double bass has probably passed through countless sampling systems and digital edits; if you do a certain type of music, they will label you under a certain category. But what else are they going to say about me? Big fat bloke out of nowhere, must be a computer geek, must spend all his time looking at dirty pictures on the

The single "Your Woman" is possibly the most basically recorded song ever to get to Number One in the UK.

What equipment did you use?

Both the single and my album were made with an old Tascam 688 multitrack tape recorder, an Atari ST, and a free sequencer disc I got from the front of a computer magazine because I couldn't afford a "proper" sequencer. In fact, I just bought my first piece of legal software today – I've never had enough money before.

So are you going to get a state-of-the-art studio setup?

No. Art needs limits. One of the things wrong with contemporary recording is that it's too generic, too sterile. Technology can make things too perfect – it can dehumanize you if you let it. You've got to fuck up the technology you've got rather than let the technology fuck you up. It took me two days to get the beats slightly out of time on "Your Woman." Two days! Getting them in time took two seconds. At one point I was routing the sync signal from the multitrack to my computer through a little box I'd built to put in noise.

Today's music is all the same; all the studios have the same gear, their Korg M1s, their Trinitys. You can hear those sounds a mile off. My album is full of pops, clicks, buzzes, and hums, notes I don't quite get to, notes I miss completely – but it's all part of being human. The perfection is in the imperfection.

On a dreary day in England early this year, Jyoti Mishra (aka White Town) mailed out five copies of an EP he'd recorded in his bedroom using an Atari ST, free software, and an old multitrack. Without any promotion, his song "Your Woman" – a catchy '80s-sounding slice of technopop – was picked up by BBC Radio 1 and put into heavy rotation. Four weeks later, the unknown 30-year-old from Derbyshire had signed with EMI and entered the UK charts at Number One.

BEDROOM TO BIG TIME

White Town's success has brought backroom production values center stage and left music pundits vacillating between declaring him a hero for lo-fi computer geeks and dismissing him as a one-hit wonder. He has since released the album *Women in Technology*, made a splash in the US, and left the big labels wondering how long they can hold out before cheap technology and the distributive power of the Net take over their turf. "The future for people like me," says Mishra, "is wide open."

Net. They fail to realize that the Internet is about more than that. **How have you used the Net?**

I had my own Web site, but it wasn't really much cop because I'm not that good at writing HTML. I use the Net predominantly for communicating, through email and newsgroups such as UK Music Alternative and UK Music Miscellaneous. That's how I met Anthony Chapman from Collapsed Lung, who did the remix for the 12-inch.

We started emailing each other

because we had similar tastes in music; when the chance came up to get a remix commissioned, I asked him to do it.

That wouldn't have happened without the Internet. Similarly, there's loads of people I know in America – like my old label Parasol – who I met through Net conversations. It's a different level of experience: people aren't bothered by the superficial things. People buying my records are doing so not because of what I look like but because of the music itself.

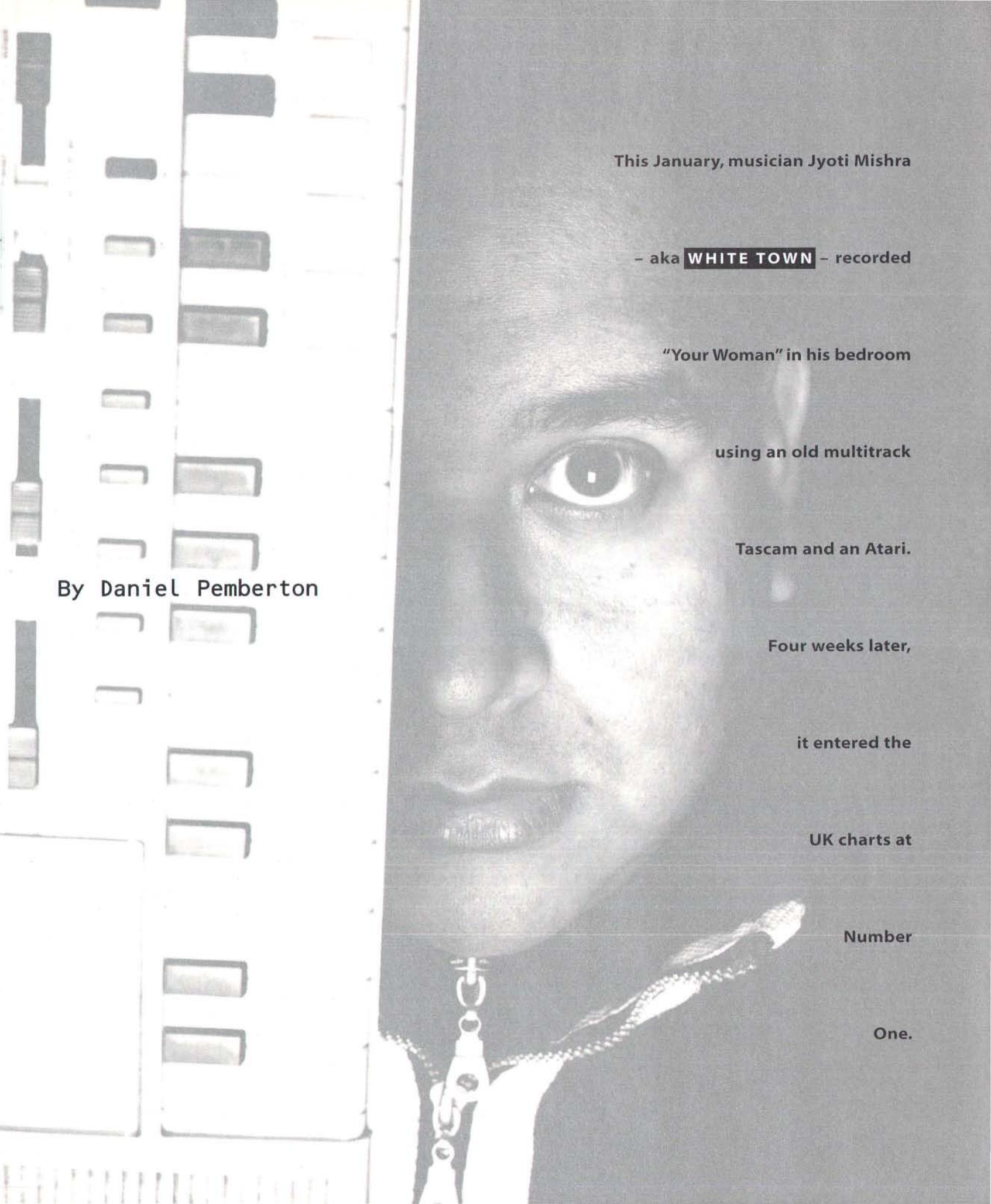
Ten years ago, it was impossible to produce a Number One record in your bedroom. Is the prevalence of high-quality affordable recording equipment going to change the music industry?

Technology is one of the major democratizing forces for art, especially pop music. If you were a fine-arts painter, for example, how would you get an exhibition at the Royal Academy? You'd have to know the right people, hang out with them, move to London, and then, maybe, after 15 years somebody might sponsor you. Me, I've come from nowhere and gone to Number One with no help at all except for radio play. I know I got a lucky break, but the future for people like me is wide open; we're on a new frontier. Once digital cash is sorted out, we're going to successfully make and distribute the music ourselves; that's going to worry the record labels. If you can publish to the world yourself, why have a record company? They're going to have to give you a really good reason to sign.

So will the geek inherit the earth?

EMI's lawyers don't think so. ■ ■ ■

Daniel Pemberton (www.state51.co.uk/pemberton/) also records and produces music in his bedroom. He hasn't had a Number One hit yet.



This January, musician Jyoti Mishra

– aka **WHITE TOWN** – recorded

“Your Woman” in his bedroom

using an old multitrack

Tascam and an Atari.

By Daniel Pemberton

Four weeks later,

it entered the

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AT ISPS, INTERNET CAFÉS, EVEN STATE
CENSORSHIP COMMITTEES, WE MEET THE WIRED OF CHINA -

THE GREAT

AND DISCOVER THAT THE TECHNOLOGY CHINA NEEDS
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THE 21ST CENTURY THREATENS TO UNDERMINE
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FIREWALL

AND BEIJING'S CONTROL FREAKS ARE WORRIED.

OF CHINA

BY GERMIE R. BARMÉ & SANG YE

PHOTOGRAPHY BY MARK LEONG / MATRIX

WIRED JUNE 1997

138



Beijing Train Station
March 1997



"INFORMATION INDUSTRIES OF CHINA UNITE!"

In the hype-ridden People's Republic of China, 1996 was the "Year of the Internet." Barely 1 in 10,000 Chinese is actually wired. But the Net takes aim squarely at things that since the days of Mao have been the state's exclusive domain.

Xia Hong manages public relations for a year-old company called China InfoHighway Space. It's one of the slickest examples yet of the latest innovation on Beijing's frenetic corporate scene: Internet service providers. China InfoHighway's offices in Beijing's Haidian District have the airy, glaringly bright-lit open-plan arrangement favored by new-look Chinese companies. Its logo – a spermatozoid yin-yang – decorates everything in sight. A banner across the top of its homepage blazes: "Information Industries of China Unite!" As Xia Hong is happy to make clear, that's not the only thing about China InfoHighway that screams 1997-style Chinese neosocialism:

The Internet is out of kilter with modern organizational principles. It has failed to evolve effective means of control. Frankly, I see it as being just like the United Nations. As you well know, that body is the most important in the world, and let's not even talk about it being efficient or cost effective. All that confused yabbering, good and bad, right and wrong, all mixed up together.

A network that allows individuals to do as they please, lets them go brazenly wherever they wish, is a hegemonistic network that harms the rights of others.

There's no question about it: the Internet is an information colony. From the moment you go online, you're confronted with English hegemony. It's not merely a matter of making the Net convenient for users in non-English-speaking countries. People have to face the fact that English speakers are not the whole world. What's the big deal about them, anyway?

Our ideal is to create an exclusively Chinese-language network. It will be a Net that has Chinese characteristics, one that is an information superhighway for the masses.

Ms. Z – she asked us not to use her name – is an 18-year-old recent graduate of a private secretarial college in Shanghai. We talked to her at the Shanghai Internet Cafe on Jinling Donglu, a bustling thoroughfare in the center of the nearest thing China has to

Geremie R. Barmé (geremie@coombs.anu.edu.au) is a Senior Fellow at the Australian National University. He co-wrote The Gate of Heavenly Peace, a documentary about the Tiananmen Square uprising that won a 1997 Peabody Award. Sang Ye is a Chinese journalist who divides his time between China and Brisbane, Australia. His most recent book is The Year the Dragon Came (University of Queensland, 1996).

an urbane metropolis (at least until Hong Kong's long-awaited return to the motherland on July 1):

If you want a well-paying job with a foreign firm, it used to be you only needed to speak English and be able to use a computer. Now you also need Internet know-how.

Today I'm here to send some emails to friends in Canada. It's much cheaper than the post office fax service – Y70 (about US\$8) for two sheets! Here I pay Y30 for an hour, send my letters, have a look around the Net, and get a cup of coffee thrown in free. Of course it's pricey, but places like this aren't run for country bumpkins. If you can't afford it, stay home and drink boiled water!

We're living in an information society now, and every idea is valuable. People who provide freeware or shareware on the Net for others to download are just so stupid. What a waste of effort! As for giving other people ideas via the Net, you'd have to be a half-wit. Why let someone else profit from your ideas?

What I hate most about the Internet is that there are so many wonderful shopping opportunities – all the nice clothes and makeup – but I can't buy any of it. For example, Chanel No. 19 costs nearly Y800 (US\$96) in the Shanghai shops; on the Net, it's only half that, including postage. But even if I had a foreign-currency credit card, it would be useless: customs duty in China is so high, it's prohibitive. So the more I see things on the Net, the more upset I become.

In the hype-ridden People's Republic of China, 1996 was the "Year of the Internet." No matter that, by the highest estimates, only 150,000 Chinese people – barely 1 in 10,000 –

are actually wired. Or that most mainland Chinese have never touched a computer, or that there are 17 people, on average, for every phone line. From Beijing in the north to Guangzhou near the border with Hong Kong in the south, breathless news reports insist that China's traditional greeting, "Ni chifanle ma?" – Have you eaten? – is being replaced. Now any forward-looking person asks, "Ni shangwangle ma?": Are you wired?

It's not just press hysteria: in Beijing, shiny new computer monitors line the second floor of the famed Foreign Languages Bookstore, pushing Chinese-language versions of Eudora and the latest delights of Netscape and Internet Explorer where the interminable works of Mao, Stalin, and Enver Hoxha once held sway.

Earlier this year, the craze was modem introductory offers – computer companies flogging hardware and software packages from street stalls outside





Sculptors at Beijing's Central Academy of Fine Arts race to finish a memorial to paramount leader Deng Xiaoping (left), who died in February at 92. The statue is due to be in place at Shenzhen, near the border with Hong Kong, by July 1, in time for the man most responsible for China's Open Door policy to watch the British colony's return to the motherland.



department stores. Bill Gates's *The Road Ahead* has sold more than 400,000 copies – pirated editions not included. Even the massive billboards that line roads, mark intersections, and clutter the countryside are as likely now to feature Acer, Microsoft, or home-grown Beida Fangzheng computers as Shiseido cosmetics, XO cognac, or the Communist Party's latest propaganda.

But nothing seems to have loosened slogan writers' pens quite like the Net itself:

Join the Internet club; meet today's successful people; experience the spirit of the age; drink deep of the cup of leisure.

Buy Internet, use Internet. Get on board the ark to the next century. Win the prize of the world.

Internet, the passport of the modern, civilized man.

Driving from the airport into Beijing in February, we listened to a radio feature about the latest developments in online technology on the popular program *Good Morning Taxi!* "The Internet is not only about information," the report concluded. "It's about new ways of thinking, new ways of living."

That, of course, is precisely what worries China's rulers. New ways of thinking, of communicating, of organizing people and information – the Net takes aim squarely at things that since Mao's earliest days have been the state's exclusive domain. For a country still coming to grips with the passing of its latest great leader, Deng Xiaoping, it's a double shock of the new:

the technology that China needs to build the most powerful country on earth in the 21st century could also undermine the monolith state itself. Where the quest by Deng's successors to control the Net and its consequences will lead, no one knows. But no one doubts that the Net, that amorphous and unpredictable messenger, holds out tantalizing possibilities for a country so long turned in upon itself.

From his home in Beijing, one of China's pioneer telecommuters, Pan Jianxin, writes a widely read computer column for the popular Guangzhou-based weekend paper *Southern Weekly*:

I'm on the Net maybe four or five hours a day. The phone bills are murder and my wife complains, but I can't keep off it. The Net is a world unto itself.

Sound familiar? He could be any Net columnist anywhere. But this is China:

The general cultural level of the nation is woeful. We're still trying to get people to stop spitting in public. So the Net is not a main issue.

DEUS EX MACHINA

Neophilia is a double-edged sword that China has eagerly grasped since the middle of the last century. In earlier eras, it was political revolution – including "scientific" socialism – that promised a quick fix to China's problems. Today high technology is the deus ex machina. The question on everyone's mind – the Chinese government and its critics alike – is whether it will also be a cultural and political Trojan horse.

The latest tide of high tech adulation in China started building in the early 1990s, often with a comic tinge. First it was streetside "computer fortune telling," then "computer diagnosis" – traditional Chinese medicines mysteriously dosed out by machine. More recent crazes – supported by the inevitable billboards and hoardings – include "computer" car washing (electronically controlled sprayers) and beauty salons (automated facial analysis): not the stuff to cause anyone to lose sleep at the Public Security Bureau.

The Net has been more problematic. As in most of the world, scientists were Internet pioneers; the difference is that, due to lack of interest and primitive infrastructure, the first serious network wasn't put together until 1993. Two years later, the national university system followed, with what is still a cherished innovation: email connections, both within the country and to the outside world.

Then came a publicist's dream that brought the Net nationwide attention. Zhu Ling, a young science student at Beijing's elite Qinghua University, fell mysteriously ill. As her condition deteriorated, distraught friends appealed for help on the Net. Thousands of responses flooded in from around the world – 84 of which (according to more of those breathless press accounts) correctly diagnosed thallosclerosis, a rarely seen condition caused by exposure to the element thallium, in her case during laboratory experiments. Zhu Ling was treated and eventually began a slow recovery; the Chinese public was enthralled. A television miniseries is reportedly in the works.

That's the dream. Here's the reality: 86 percent of China's citizens have never touched a computer. Only 1.6 percent of Chinese families own one, and just 4.1 percent plan to buy. (The figures come from the Yangshi Survey and Consulting Service Center, a Beijing marketing firm.) Of course, that still means 10 or 20 million potential sales, which is why US and European computer companies don't do too much complaining about Chinese Net freedoms.

University students are encouraged to use email to plan study overseas, but only a small number of graduate students and faculty, mainly in technical disciplines, enjoy real access to the Web. Most mainland Chinese – say, a billion or so people – wouldn't know the difference between the Internet

www.wired.com/5.06/china/

We listened to a report on a popular Beijing radio show. The Internet, the show concluded, "is about new ways of thinking, new ways of living." That, of course, is precisely what worries China's rulers.

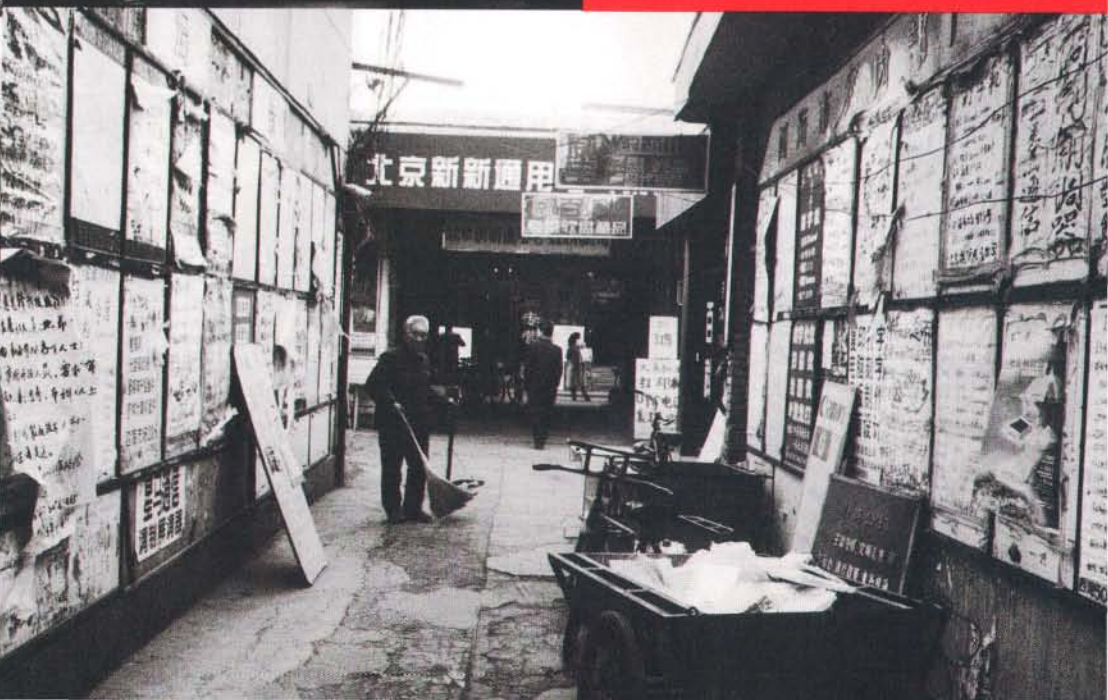


"Join the Internet club; meet today's successful people; experience the spirit of the age."

"Buy Internet, use Internet. Get on board the ark to the next century."

"Internet, the passport of the modern, civilized man."

— promotional slogans for Chinese modems and Internet access software

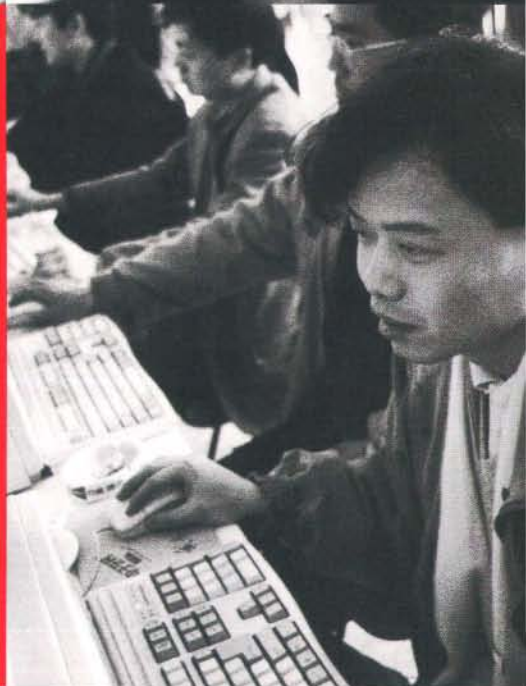
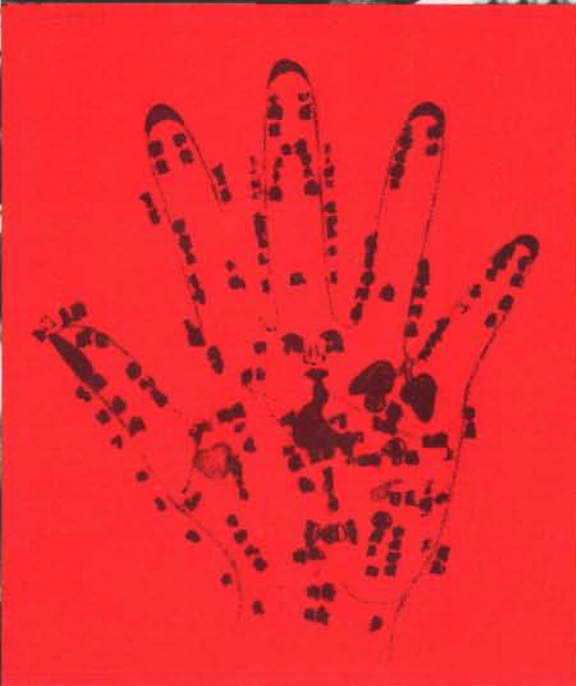




06/40 2M/1.44M/VGA
86/100 4M/1.44M/540M/28
86/100 8M/1.44M/540M/28
通型多媒体: 软解压+声卡+四速光
5/100 8M/1.44M/540M/28
5/133 8M/1.44M/540M/28
5/150 8M/1.44M/540M/28
5/166 8M/1.44M/540M/28
高档型多媒体: 硬解压+声卡+八速光驱
CY/133+ 16M/1.44M/1.2G/28

China's tide of high tech adulation started in the early 1990s, often with a comic tinge. First it was streetside "computer fortune-telling," then "computerized" medical diagnosis, car washes, and beauty salons. Today, whole electronics districts have sprouted, including Beijing's Zhongguancun and Shanghai's Putuo, featuring storefront computer shops, swap meets, and alleys lined with buy-and-sell ads. Internet cafés are a minigrowth industry. And the latest fad is ISPs – at last count Beijing alone had 32, all vying for customers. The ISPs have their work cut out for them: 86 percent of China's citizens have never touched a computer. Only 1.6 percent of Chinese families own one, just 4.1 percent plan to buy. Most mainland Chinese – say, a billion or so people – wouldn't know the difference between the Internet and "The Internationale," the Communist Party theme song.





and "The Internationale," the Communist Party theme song.

But however small the numbers, for the Chinese government's control freaks – and that means basically everyone in authority – free-flowing information and unauthorized association are profoundly disturbing concepts. The Communist movement itself was born in China of surreptitious gatherings, cell meetings in gloomy garrets, and covert exchanges of information – plus a large dose of mass dissatisfaction and oppression. Mention information revolution, and the instinctive overreaction is to clamp down.

State Council Order No. 195 is titled "Temporary Regulations Governing Computer Information Networks and the Internet." Signed by Premier Li Peng on February 1, 1996, the law contains the following gems:

The State is in charge of overall planning, national standardization, graded control, and the development of all areas related to the Internet.

Any direct connection with the Internet must be channeled via international ports established and maintained by the Ministry of Post and Telecommunication. No group or individual may establish or utilize any other means to gain Internet access.

All organizations and individuals must obey the respective state laws and administrative regulations and carry out rigorously the system of protecting state secrets. Under no circumstances should the Internet be used to endanger national security or betray state secrets.

SPIRITUAL POLLUTION CONTROL

In an equipment-crowded office in the Air Force Guesthouse on Beijing's Third Ring Road sits the man in charge of computer and Net surveillance at the Public Security Bureau. The PSB – *leizi*, or "thunder makers," in local dialect – covers not only robberies and murder, but also cultural espionage, "spiritual pollutants," and all manner of dissent. Its new concern is Internet malfeasance.

A computer engineer in his late 30s, Comrade X (he asked not to be identified because of his less-than-polite comments about some Chinese ISPs) is overseeing efforts to build a digital equivalent to China's Great Wall. Under construction since last year, what's officially known as the "firewall" is designed to keep Chinese cyberspace free of pollutants of all sorts, by the simple means of requiring

ISPs to block access to "problem" sites abroad.

Comrade X explains: "The first line of defense is what we call 'preventative interference,' based on selected keywords. What we're particularly concerned about is material aimed at undermining the unity and sovereignty of China (that is, references to Tibetan independence and the Taiwan question), attempts to propagate new religions like the Children of God, and dissident publications. Commonplace ideological differences of opinion are now generally ignored."

It's no great technical trick, especially since connections to the outside world are required to pass through a handful of official gateways – the PTT's ChinaNet and the Ministry of Electronics's "Golden Bridge" are two of the biggest – which do their own filtering up-front. Among the things they block, depending on circumstances, are most of the Western media, as well as the China News Digest – a sprawling online service run by Chinese exiles – and other specialized sites and newsgroups operated from abroad. Eager for a slice of the action, the major global networking companies – Sun Microsystems, Cisco Systems, and Bay Networks, among others – cheerfully compete to supply the gear that makes it possible.

But as Comrade X also notes, it's not just a matter of technology:

Naturally, many questionable sites still go undetected. So the way we prefer to control things is through a decentralized responsibility system: the user, the ISP, and China Telecom are all held responsible for the information users gain access to.

People are used to being wary, and the general sense that you are under surveillance acts as a disincentive. The key to controlling the Net in China is in managing people, and this is a process that begins the moment you purchase a modem.

JUST SIGN HERE

So you want to get wired in the People's Republic? Let's recap the simple steps to get online:

First, pick an ISP – there were 32 in Beijing at last count, ranging from government-run companies and China Telecom to ambitious private start-ups like China InfoHighway. You fill out some papers and provide an ID card (or, for foreigners, a passport). The initial Police File Report Form has to be filled out in triplicate – a copy for your ISP, one for the local PSB, the third for the provincial-level PSB Computer Security and Supervision Office.

Next there's the Net Access Responsibility Agreement, in which you pledge not to use the Internet to threaten state security or reveal state secrets. You also swear not to read, reproduce, or transmit material that "endangers the state, obstructs public safety, or is obscene or pornographic."

Finally, there's an application for the ISP itself – where you live and work, your profession, your home and office phone numbers, your mobile phone, and even your pager. Plus details about your computer equipment, the modem type, and, oh yes, its permit number. Back to our friends at the PSB for that.

"All organizations and individuals must vigorously carry out the system of protecting state secrets. Under no circumstances should the Internet be used to endanger national security or betray state secrets."

China today is a jarring clash of old and new ways: cellular phones and ancient games, antique habits and Internet cafés, rice bowls and McDonald's.

What started 20 years ago with Deng's Open Door has had momentous, mostly uncalculated consequences. People are tuning out Mao suits, ration books, and state TV, and tuning in foreign fashions, credit cards, even surreptitious news slipped in over the Net. But that does not mean that the China of the future is going to look more like us. It is going to look like China.




"As we stand on the cusp
of the new century, we need
to challenge America's
dominant position.

In the 21st century, the
boundaries will be redrawn.

The world is no longer the
spiritual colony of America."





China is embarked on what local economists call "the acquisition of primitive capital." Individuals, companies, and state enterprises are vying for advantage in the rough-and-ready atmosphere of a virtually unique historical moment: simultaneous industrial and information revolutions in the world's oldest, most populous nation. Clockwise from opposite top left: shoppers in Guangzhou; investors crowd Shanghai's stock exchange; new buildings go up; old ones wait for demolition; foreign heroes; a Beijing student monitors her peers.

Now you're getting close to that "passport of the modern, civilized man." But you still have to pay. That means either a check or a bank account name and number – credit cards are not welcome. Figure a monthly net-plus-phone bill of Y350 (US\$42) – roughly half a recent college graduate's monthly salary. Someone with a good job at a foreign corporation in Beijing or Shanghai can probably manage it. And so, of course, can the media-starved expatriates they work for. As Comrade X remarked about the system's launch last year, "It was a real thrill to see all the foreigners lining up outside our office to be registered."

THE ECSTASY OF COMMUNICATION

Here's how Sparkice, a Sino-Canadian joint venture, promotes its new Internet Cafe in Beijing, the largest in the city since it opened in November:

Under the searchlight of history, on the cusp of the new century, a brightly lit Great Wall is spreading rapidly out of China toward the rest of the world. Its light conveys a message of a holy duty: Sparkice is building a multimedia platform that will surprise the globe.

Internet cafés are one of China's minigrowth industries. They combine sought-after "imported" atmosphere with basic online services – "the ecstasy of communication," as one flyer puts it. There's a cluster of modest operations – the Papillon Music Internet Cafe is one – near Beijing University's main entrance, next to Zhongguancun, the city's electronics district.

Some have only a single computer and, judging from the Papillon, warm service but weak coffee and a serious blight of plastic foliage.

Sparkice, next to the Capital Stadium's west entrance, has higher aspirations – it includes its own ISP, for starters. The stadium itself is worth a visit: a major sports venue during the Cultural Revolution, it is now an oversized furniture display hall. The café, for its part, is done in the latest international techno style – glitzy ambient lighting, 10 shiny new computers, and TVs beaming in the latest NBA games.

But "Chinese characteristics," as Comrade X would call them, are right there, too. Anyone is welcome to order a cappuccino, but going online requires you to run the same bureaucratic maze as getting wired at home: Police File Report Form, Net Access Responsibility Agreement, and ISP contract. Plus an ID card or passport number, and the details of where you live and work.

Then there are the rules: no attempts to visit forbidden sites, of course, or to download inappropriate material. No changing machines during a session. Only one person online at a time. And the logs of your activities may be checked. "If anything out of the ordinary is discovered," says the contract, "you will be fined accordingly" – up to 10 times the cost of your time online. For serious breaches, the waitpersons-cum-Net police are authorized to hand you over to the authorities. Happy surfing – or, as they say in Mandarin, *manyou*, "roaming at will." At 14.4 Kbps. 174 ▶

HANDS OFF HONG KONG

BY LOUISE NAMETH

Donald Tu was crossing one of Hong Kong's busiest streets when his cell phone rang. It was Hongkong Telecom IMS, his Internet service provider, complaining about the content of his homepage and stating that they would remove the Web site if he didn't. Donald's Page (www.hkstud.com/), as Tu's site is called, features several nude photographs of the gay Hong Kong disc jockey, with his black-and-white baby photos as a backdrop. Full frontal nudity is obscured. But by the time

Tu got home, his homepage was gone.

Tu had been signed up with another ISP, HKNet, which briefly removed his homepage "for review." Later, he received an email from HKNet requesting that he permanently take down the site. Fed up, he then transferred his homepage to an American ISP. "I don't need the hassle," he says, "particularly when the dinosaurs come."

While some fear that a clampdown on electronic rights could hit Hong Kong when the British crown colony reverts to the People's Republic of China on July 1, people like Tu know that the whiff of censorship is already in the air.

CHINA'S LEADERS SAY OPEN INTERNET BUT FREE-SPEECH ADVOCATES AND A

They have seen at least one sobering example of how easily local police can halt Internet access. In March 1995, Hong Kong police raided all but one of the local ISPs offering dialup service, confiscating PC equipment and records and shutting down the access providers for a week. Although the raids were ostensibly launched to crack down on hackers, the only ISPs to get hit were those that had resisted a new surcharge on Internet usage. It was the government's way of reminding them who was boss. With local law enforcement this draconian, residents wonder what's in store under mainland rule.

A continuation of such raids could have severe repercussions for the subtropical island's business community, which has long thrived on unfettered capitalism. Hong Kong is best known for its ability to make money, thanks to a large harbor, a network of powerful banks, and a HK\$2.86 trillion (US\$370 billion) stock market that is more than three times the size of China's. Many consider the city to be China's Wall Street; one-third of direct-investment funds flowing into the mainland last year came through Hong Kong. Nearly half a million companies are registered there, including 500 foreign-owned banks.

Writer Louise Nameth (bluestar12@aol.com) covers finance and technology from New York.



"Hong Kong, the Motherland Welcomes You."

This is the message on the blackboard at the Hongmiao Elementary School in Beijing. One student wrote to his cross-border counterparts: "After a century of hard times, Hong Kong will finally return to the motherland's embrace. Do you know about the motherland? Led by President Jiang Zemin, it is developing rapidly. Unfortunately, our dear Grandpa Deng Xiaoping passed away before he could see the handover."

ACCESS WILL REMAIN AFTER THE JULY 1 TAKEOVER OF THE BRITISH CROWN COLONY. NERVOUS BUSINESS COMMUNITY CLAIM THAT A CRACKDOWN HAS ALREADY BEGUN.

In 1995, merchandise trade accounted for HK\$2.8 trillion (US\$367 billion); the service industry alone is a HK\$457 billion (US\$59 billion) annual business. And they're a heavily wired bunch. Hong Kong has spawned more than 90 ISPs – about half of which remain active – ranging from one-person servers to powerhouse telcos like Hongkong Telecom. An estimated 300,000 people have Internet access.

Officially, the ruling British government has said that Hong Kong would continue to operate under existing laws when the Chinese flag is raised over the city this summer. The plan, which was reached

under an agreement with the United Kingdom in 1984, calls for making Hong Kong a "special administrative region" within China and leaving Hong Kong's legal systems in place. Nothing is *supposed* to change. "Hong Kong is too important to the Chinese for them to interfere," says Michael Wu, deputy chair and COO of the Hong Kong Securities & Futures Commission.

Free-speech advocates are not so sure. China has long tried to suppress the open exchange of information and has been particularly tough on those who attempt to build an electronic bridge to the outside world. China's rhetoric

about "one country, two systems," for instance, provides little comfort to local legislator Emily Lau, leader of the prodemocracy Frontier Party. "We don't rule anything out," Lau says. "I cannot say that China will *definitely* clamp down, but that is the fear of many within the Internet community. China is intolerant of free expression, particularly if it's critical of the government."

C. H. Tung, the Hong Kong government's newly appointed head, has said that individual rights should be subject to the will of the people. Tung has also indicated that making derogatory remarks about Chinese leaders after the transition

may be illegal, and he has moved to replace the colony's legislature with one consisting of Beijing-approved representatives. In addition, China will invalidate parts of a Hong Kong Bill of Rights passed six years ago. The new government has announced plans to repeal or amend 25 existing laws, including many pertaining to civil liberties. Permission to demonstrate, for example, soon must be requested one week in advance, and all meetings of 20 or more people will have to be registered with the government. The changes also tighten controls on links to foreign organizations and will weaken privacy rights. 182 ►

Officially, the Chinese government vows that the status quo will remain. But "one country, two systems" rhetoric offers little comfort to local legislator Emily Lau. "We don't rule anything out," she says.

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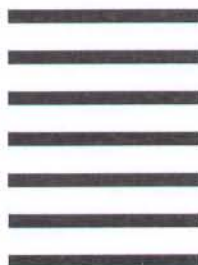
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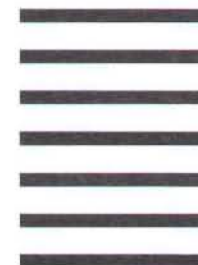
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Listen Hear

All I want is to have my PC type as I speak. Today three programs – made by Dragon Systems, Kurzweil, and IBM – promise just that. After trying each one, I find they're all at a loss for words.

Dragon's Dictate software is easiest to use and the most accurate. Dragon has a good reputation among disabled students, lawyers, and journalists: put a microphone in front of a Windows-based computer, and you can use it without touching the keyboard. The deluxe US\$1,695 DragonDictate, which recognizes 60,000 words, isn't cheap; more modest versions include a 10,000-word model for \$99. You'll find yourself spelling out perhaps 10 per-



Talk to type.

cent of the words you use daily. Fortunately, you only have to spell them out once.

The system understands grammar, so it recognizes the difference between "Please turn right" and "Please write your name." When it goofs up, you either add the word to its vocabulary or speak more clearly. A quiet room is a necessity.

I've used Dragon successfully for hour-long chat sessions, but for writing email, I still find it easier to type and take frequent breaks.

—Simon Garfinkel

DragonDictate 2.5.2: US\$99, \$395, \$695, or \$1,695. Dragon Systems: +1 (617) 965 5200.

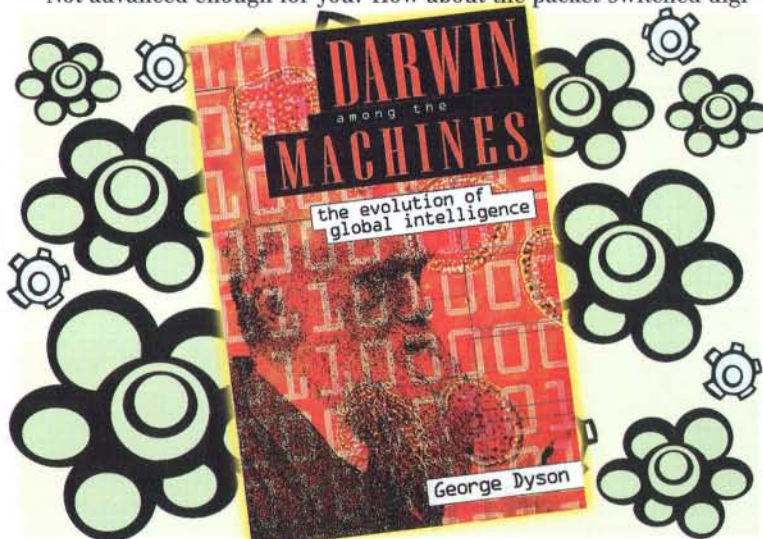
Breeding the Machine

Darwin *Among the Machines* is not your usual cutting-edge book about self-organizing systems, parallel processing, and artificial life. Author George Dyson covers those topics, and covers them well, but through the eyes of people who have never heard of chaos theory, the Santa Fe Institute, or the MIT Media Lab.

This book's heroes are great thinkers of history like Leibniz, Hooke, and Darwin – not Charles, but his grandfather Erasmus, who wrote in 1794 that "the world itself might have been generated, rather than created; that is, it might have been gradually produced from very small beginnings, increasing by the activity of its inherent principles."

Another typical protagonist is Lewis Fry Richardson, who proposed using 64,000 computers concurrently to predict the weather. Richardson made his proposal in 1917, at a time when a "computer" was a person with a pencil. His 0.0000001-megahertz clock was a human conductor with a baton, and his packet-switched communication system involved passing around slips of paper.

Not advanced enough for you? How about the packet-switched digi-



The startling relationship between nature and machines.

tal communications system, based on optical technology, that spanned Europe in the 18th century? You'll have to read the book to get the details, but I'll give you a hint: it worked at the rate of about two signals per minute.

The book is full of historical anecdotes, and Dyson tells them well. But this is much more than a history book. The author weaves his threads together for a purpose. Using voices of the past and present, he describes a fresh and sometimes startling viewpoint of the emerging relationship between nature and machines. From vignettes about Olaf Stapledon, George Boole, John von Neumann, and Samuel Butler, a larger story develops in which the twin processes of intelligence and evolution are inseparably intertwined. As Dyson explains in the preface, "In the game of life and evolution, there are three players at the table: human beings, nature, and machine. I am firmly on the side of nature. But nature, I suspect, is on the side of machines." —Danny Hillis

Darwin Among the Machines, by George Dyson: US\$25. Addison Wesley Longman: +1 (617) 944 3700.



Rocket Jockey

Speed and destruction alone can't guarantee an engaging computer gaming experience. Sure, once it may have been fun to blast away at the enemy like an idiot. But collective tastes have matured, and the rabid legion of joystick-gripping gorehounds demands a more refined brand of mayhem. For such connoisseurs, I recommend *Rocket Jockey*.

A wicked sense of humor and speed-demon action come together in a game as inventive as it is addictive. The setting: a gladiator-style arena where jockeys go head-to-head astride rockets. These sporty blasters – a curious blend of '50s hot rod and 21st-century jet – look like low-flying ICBMs with steering



A flaming find.

wheels. The only way to effectively control one is to launch grappling hooks at pylons scattered throughout the arena – these killer cables add a dimension of challenge and strategy that's usually missing in racing games. Once secured, a cable will wing the rocket around in a seriously fast one-eighty. The same cables can be used to clothesline your opponents and latch them onto exploding balls.

Networkable for up to six players, *Rocket Jockey* is an all-out free-for-all. This is the kind of maniacal fun you can't have in real life – at least as a law-abiding citizen. – *Scott Taves*

Rocket Jockey for Windows 95: US\$29.99. Segasoft: +1 (415) 802 4400, on the Web at www.segasoft.com/.

McLuhan Lives

The *Video McLuhan* is an adroitly edited, six-video collection of Marshall McLuhan's public pronouncements, entertainingly anchored by Tom Wolfe. McLuhan was a fabulous trickster, and in these tapes his talent for putting on an audience is fully visible. Many segments are from vintage television talk shows, and it is as interesting to note the wandering pedantic, nicotine-addled style of this once-gentle genre as it is to watch McLuhan explain the disappearance of the unconscious amid choking clouds of cigarette smoke.

McLuhan is often intentionally oblivious to points his interviewers are trying to make, and we frequently find ourselves bobbing helplessly in a stream of references and definitions. Through it all, however, the professor brings a loquacious integrity to his style and his discoveries. Part of the fun is watching him resist the blandishments of various luminaries as they try to water down his message. When Tom Snyder challenges him at one point to explain why he is so hard to understand, McLuhan tells him straight out that it is because people



Two decades of McLuhan's public pronouncements captured on VHS. are not accustomed to using their wits.

Wolfe vigilantly follows the shifts in McLuhan's thinking through the '60s and '70s and gives advance warning about what to look for in the interviews. Still, frequent use of the rewind button is required. McLuhan constantly changes gears, alternating between exhortations to appreciate the profound shift in human culture caused by electronic media and statements of his opposition to this shift. The tapes present an especially good portrait of McLuhan's intellectual influences: his Catholicism, his mysticism, and his strange brand of conservatism. My favorite quote: "I am resolutely opposed to all innovation, all change. But I am determined to understand what is happening, because I don't choose just to sit and let the juggernaut roll over me."

The Video McLuhan is guaranteed to become a hardy perennial of media studies syllabi, and at US\$595 for the series, the best place to watch it will be at the library. – *Gary Wolf*

The Video McLuhan: US\$595. Video McLuhan Inc.: +1 (416) 484 6378, on the Web at www.videoemcluhan.com.

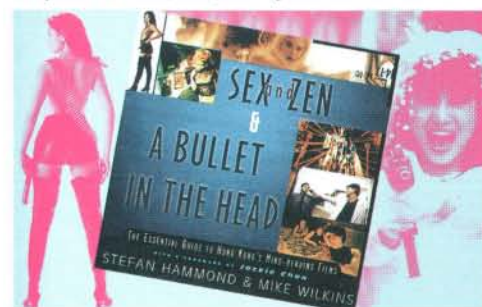
Films on Fire

For American devotees of Hong Kong action films, 1996 will be remembered as the year the ingenuity and breakneck kinetics of this genre stormed the Western world. Among other notable inroads, Jackie Chan broke through as a Hollywood star, and *Broken Arrow* vaulted director John Woo to A-list status.

Sex and Zen & a Bullet in the Head, the first attempt by a major US publisher to map this phenomenon, was released only months before China's takeover of the British crown colony – which leaves the fate of Hong Kong's film industry, like the city itself, on uncertain ground. The book is a solid introduction for the novice viewer and a worthwhile addition to the cinemaphile's library.

Truth be told, Hong Kong movies have suffered a troubling downturn in recent years, partly due to the diaspora of capital and creativity before zero hour. Appropriately, *Sex and Zen* is a requiem to the genre's golden era, from the mid-'80s to the early '90s, when the industry regularly created films of such wild brilliance that they made Hollywood fare look comatose.

Authors Stefan Hammond and Mike Wilkins offer chapters on Chan, Woo, and up-and-comers like mas-



"Damn, I'll burn you into a BBQ chicken!"

ter fantasist Tsui Hark and street-level auteur Ringo Lam – plus sections devoted to the martial arts, noir, and fantasy/horror subgenres, among others. These consist primarily of reviews of the best films in each category – although, too often, they are not so much reviews as exhaustive plot synopses. The book shines most in its entertaining sidebars, which include a collection of those deliciously bizarre English subtitles. (My favorite: "Damn, I'll burn you into a BBQ chicken!") And there's also a helpful compendium of related online and offline resources.

While many Hong Kong luminaries have already taken their talents to the West, the promise of a new billion-strong audience and the innovative work of such resolutely native filmmakers as *Chungking Express* director Wong Kar-wai may yet lure them back for a creative revival. Until then, *Sex and Zen & a Bullet in the Head* is a vivid reminder of the years when these filmmakers forever changed the way we look at movies. – *Wagner James Au*

Sex and Zen & a Bullet in the Head: The Essential Guide to Hong Kong's Mind-Bending Films, by Stefan Hammond and Mike Wilkins: US\$12. Fireside Books: +1 (212) 698 7076.

Amped

Old-fashioned vacuum tubes have found their way back into hi-fi designs – mostly in power amps. But these tubes have a lot going against them. Because this gear remains the province of audiophiles, prices can be stratospheric. Tubes run hot, deteriorate with age, and need to be replaced every two to four years. And the amps usually can't match the stomach-punching bass of solid-state gear.

Mesa's Baron stereo tube amp overcomes two of these drawbacks. Granted, the Baron is quite a little space heater, and yes, you'll have to drop 200 clams on fresh glassware every few years. But when I paired it with Gallo Nucleus speakers, I hit pay dirt.



Boss bass.

Baron's rich midband clarity and the three-dimensionality of its sound border on virtual reality. The sizzle of cymbals and transient snap of sticks hitting drums are startling in their accuracy and effortlessness. More surprisingly, this tube amp knows how to *rock*. The built-like-a-tank Baron took all the deep-bass abuse I could throw at it.

Knobs and switches let you alter the sonic character. What you get is really several amps in one. This is literally true – these retro Siamese twins carry a separate power supply for the left and right channels (and two power cords!). – *Rogier van Bakel*

Mesa Baron amplifier:
US\$3,695. Mesa Engineering:
+1 (707) 778 9505.

In the Bag

After a grueling day of reporting breaking news, the last thing I want to do is drive down to the grocery store to shop. So instead I fire up Netscape, jump to Shoppers Express (www.shopx.com/), and order in.

Shoppers Express is an electronic shopping service that, in partnership with local stores, delivers groceries to your doorstep. So far it covers only Los Angeles, Phoenix, and Dallas, but more cities are expected to come online soon. The company claims to offer anything available in participating stores, and after perusing its list, I don't doubt it. Who knew there were so many brands of toilet paper? Or adult diapers?

The service promises the same national brands, the same in-store prices, and the same weekly specials as big grocery store chains like Pavilions. Now, I can look for items by name or by category. Typing in "apple" brings up a choice of three dozen varieties, from Braeburn to York. I order a couple of pounds of Granny Smiths, extra large. I continue browsing, clicking on items and adding them to my list – Ajax, brown eggs, mineral water, toilet paper, and Häagen-Dazs fat-free chocolate sorbet bars. I'm creating a master list – things I'll need to reorder each time I log on. I can choose to let Shoppers Express sub-



Inconvenience shopping.

stitute a like item if the store is out of stock.

Not everything works just yet. But if you have Netscape 3.0, you can click on some items and see a picture and nutritional information. When you check out, there's space for special instructions – how thinly sliced you want your cold cuts, how ripe you like your fruit.

You can pay by credit card or check; I opt for check and enter my driver's license number. I receive an immediate email confirmation and wait 48 hours for my order. Good thing I'm not relying on this service for anything too important.

Two days later, after work, I pull into my driveway 15 minutes early for my grocery appointment, and the Shoppers Express guy is waiting for me. I tip him US\$3 on top of the \$9.95 delivery fee, making this a very expensive way to shop – at least for small orders. As I unload the bags, I see – or rather, feel – that the sorbet bars have melted. But the eggs are unbroken, the apples just right.

I call an 800 number about the Häagen-Dazs liquefaction and am promised a refund check by mail. That will be nice, I think, as I slurp down my melted fat-free – and now cost-free – chocolate bars.

– *Chris Rubin*

Shoppers Express: US\$9.95 for grocery delivery. (800) 524 8264, on the Web at www.shopx.com/.

Come Talk to Peter

Unlike *Xplora1*, Peter Gabriel's breakthrough 1994 CD-ROM, his latest creation is about neither Gabriel nor his Real World Records label. *Eve*, a multilayered gaming experience, explores the nature of relationships, with music as an integral part of the process. You don't just remix music or look in drawers; you immerse yourself in the erotic realms of love, sex, and romance.

Gabriel has crafted an impressive production, with high-end music mixed on the fly, high-speed scaling animation, and the gorgeous original art of Helen Chadwick, Yayoi Kusama, Cathy de Monchaux, and Nils-Udo. The CD-ROM begins – like life itself – with sperm and ovum. You fertilize the egg to enter the game and embark on a quest to reunite the first samplers of sin, Adam and Eve. Even more true to life, *Eve* has countless rules that no one explains and that change with unsettling frequency. Sounds, employed as clues throughout,



Lost: Adam. If seen, please return to Garden of Eden.

signal whether you're headed in the right direction.

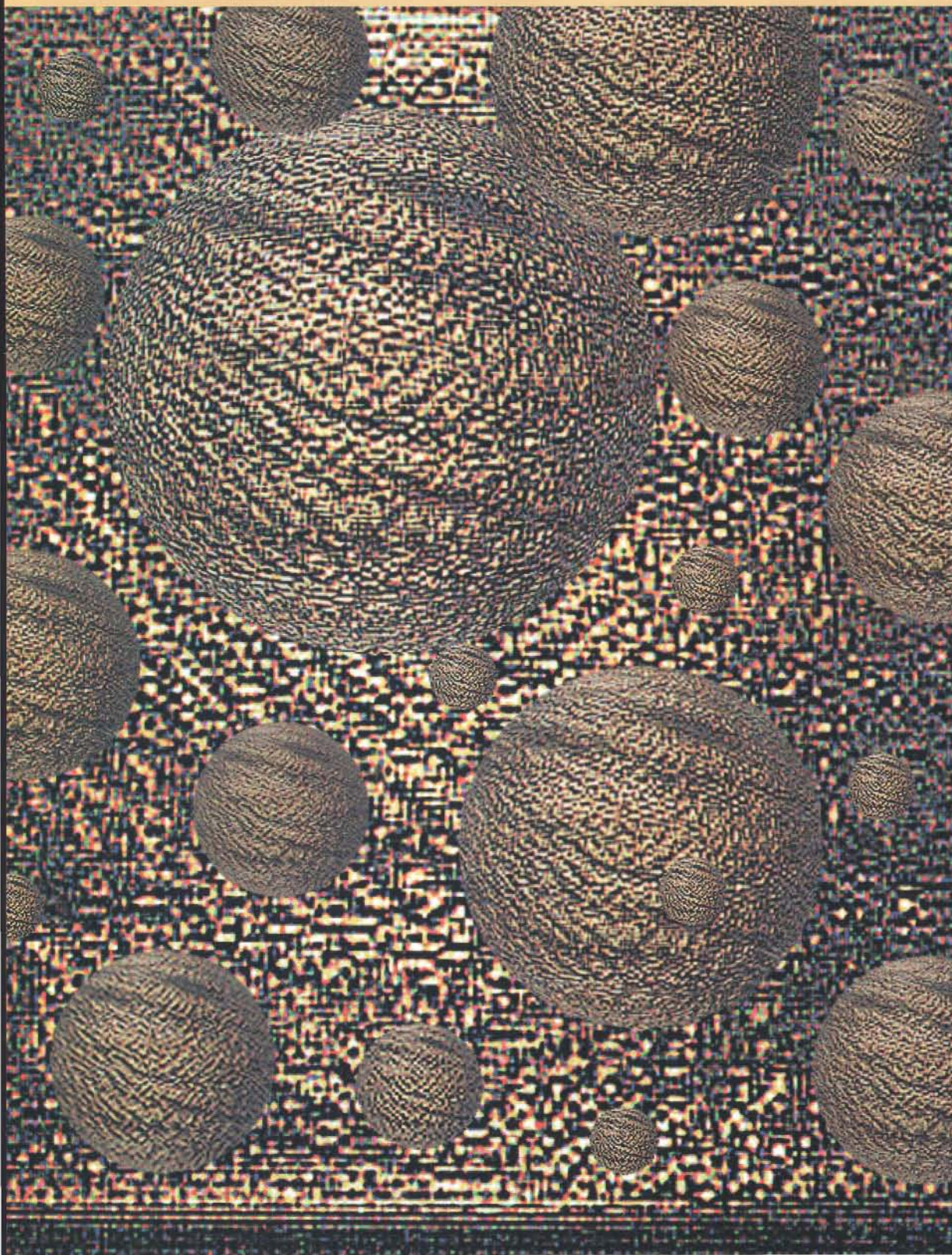
Traversing four worlds, each built around graphic art and a song written by Gabriel, you encounter rooms peopled by scientists and everyday folks. You advance by listening to their brief speeches. Using some of the items picked up along the way, you can remix Gabriel's songs. What's unusual – and enticing for fans – is the inclusion of previously unreleased instrumental and vocal tracks, so your mix can be wildly different from anything heard before.

The search to reunite Adam (often portrayed by Gabriel) with his other half moves from worlds of mud to foliage to industrial to postapocalypse in hit-and-miss fashion. Constant effort is required to find the buttons that take you somewhere. But for the visually rich design and the ability to hear and create different mixes of favorite Gabriel songs, it's a journey well worth taking. – *Chris Rubin*

Eve CD-ROM: US\$39.95. Radio Real World: on the Web at www.realworld.on.net/eve.

Exploring the Future of the Imagination

NTT InterCommunication Center



Today's electronic information revolution is effecting a great transformation in how people communicate. Focusing on electronic communication, the NTT InterCommunication Center (ICC) is dedicated to envisioning a future society rich in imagination and creativity through dialogue among science, technology, art and culture.

EXHIBITION

SPECIAL EXHIBITION



Opening Exhibition:
"The Mirage City" –
Another Utopia
Date: April 19 – July 13, 1997

The exhibition will be an experimental model for conceptualization and realization of a Utopian city for the 21st century, planned and proposed by Arata Isozaki, an architect, on the occasion of the opening of ICC.
<http://www.ntticc.or.jp/special/utopia>

PERMANENT EXHIBITION

The ICC's Permanent Exhibition features ten works by media artists from Japan and abroad. The ICC provides encounters with media environments to be found in no other museum. One work employs a CAVE three-dimensional virtual reality system, and with another, visitors can experience an anechoic chamber.

IWAI Toshio (Japan), Karl SIMS (United States), MIKAMI Seiko (Japan), Ulrike GABRIEL (Germany), Gregory BARSAMIAN (United States), Dumb Type (Japan), Heri Dono (Indonesia), Christa SOMMERER (Austria) + Laurent MIGNONNEAU (France), TOWATA Masayuki + MATSUMOTO Yasuaki (Japan), Agnes HEGEDÜS (Hungary) + Jeffrey SHAW (Australia) + Bernd LINTERMANN (Germany) + Leslie STUCK (United States)



WORKSHOP

The Trace of Toshio Iwai's Media Art –
Open Studio

Date: April 19 – June 22, 1997

The exhibition traces the trajectory of Iwai Toshio's media art works from his earliest period through the present, showing how his unique interfacing of image, sound and human being has sustained the creation of a new audio-video-sensory world.

GUIDE

- Hours: 10:00 am – 6:00 pm Friday until 9:00 pm
(No admission within 30 minutes of closing)
- Closed: Mondays (If Monday is a holiday, then Tuesday)
- Information: tel +81-3-5353-0800
- e-mail query@ntticc.or.jp URL <http://www.ntticc.or.jp>

NTT InterCommunication Center [ICC]
Tokyo Opera City Tower 4F, 3-20-2 Nishi-Shinjuku,
Shinjuku -ku, Tokyo 163-14, Japan

No Slut Sherlock Holmes is best known for employing his powers of deductive reasoning to combat crime. In *The Strange Case of Mrs. Hudson's Cat*, a book that updates Sir Arthur Conan Doyle's sleuth, author Colin Bruce presses Holmes into service to solve some of physics's most vexing problems, such as elastic space-time and quantum theory. Think of it as science made fun and, um, elementary. Release: June. Addison Wesley Longman: +1 (212) 463 8440.



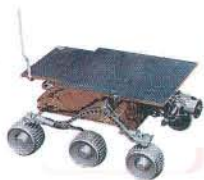
Built For Speed UUNet Technologies, the nationwide ISP, plans to spend an unprecedented US\$300 million to build a network backbone running at OC-12 (622 Mbps). The move is all the more impressive because its giant parent corporation, MFS Worldcom, already owns all of the components of a complete public communications network. Release: Summer. UUNet: +1 (703) 206 5888.

Border Skirmish Do browser wars matter in the age of ubiquitous push media? You bet. Netscape and Microsoft are readying the next iterations of their popular software, and the battles for the best email, groupware manager, and tuner are just heating up. Release: Summer. Microsoft: +1 (206) 882 8080. Netscape: +1 (415) 254 1900.



Cry Fowl The star of the popular USA Network show *Duckman* is featured in a forthcoming PC CD-ROM game. Help the sassy and sarcastic hero outwit his archnemesis, King Chicken, by guiding Duckman through a succession of perplexing puzzles. Release: June. Playmates Interactive Entertainment: +1 (714) 428 2100.

Look, Ma! Voice Pilot Technologies is ramping up production of a totally hands-free speech-recognition IRC chat client. Just log on, go to your favorite online hangout, and start yapping out loud. Voice Pilot Deluxe does the typing. It even translates between Spanish and English on the fly. Release: June. Voice Pilot Technologies: +1 (305) 828 5600.



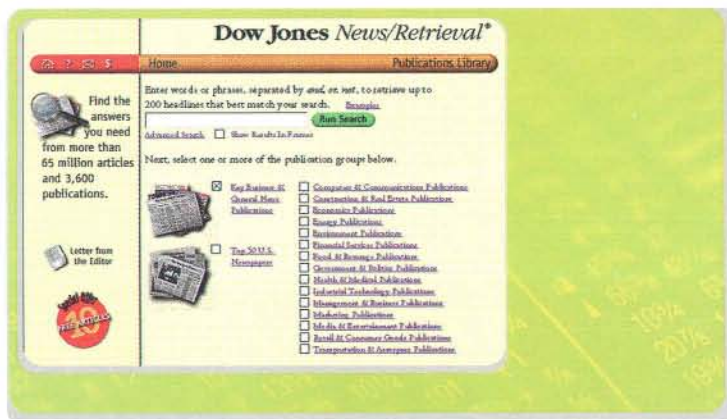
Independence Day Someone at NASA has a sense of humor. The Mars-bound *Pathfinder* is due to touch down on the Red Planet on July 4. Once the craft's surface rover starts sending back data, we'll finally be able to analyze the machinations of those evil Martian microbes. Release: July. Pathfinder: on the Web at mpfwww.jpl.nasa.gov/mpf/news.html.

THE STREET STRIKES BACK

When Dow Jones & Company instituted a subscription fee for *The Wall Street Journal Interactive Edition*, many new-media savants predicted its patrons would jump ship in favor of sites that offer free business content. Six months later, more than 70,000 people are ponying up US\$49 a year for access to wsj.com (reduced to \$29 for subscribers to the analog edition).

Building on that success, Dow Jones is nearing completion of a comprehensive Internet strategy. The company plans to develop a push-and-pull news service from its existing Dow Jones Publications Library, which contains more than 65 million articles from 3,600 publications. This summer, online subscribers will be able to search, sort, and retrieve articles from the complete archives on the Web. And a wire service called CustomClips will scan the library and deliver news direct to the desktop.

"Search engines cull the equivalent of 18 months of junk mail. There's some value to it, but it's hardly something a professional



would pay for," says editor of online services Tim Andrews. "Quality content has real value, and the lesson learned from wsj.com is that more value deserves a corresponding higher price point."

While it's easy to bemoan the xenophobia typical of big-media forays into interactive publishing, Dow Jones has an instructive track record of pioneering information systems – a vaunted tradition that dates back to the 1890s, when the Dow Jones News Service began pushing electronic news and stock quotes in the form of ticker tape over telegraph wires.

Many experts have predicted a shakeout in the Web content business, a piece of punditry that might be dismissed as fearmongering by entrenched old-media interests or embraced as sound business advice. Whatever. Having dabbled in new media for the past 100 years, Dow Jones has learned what the suits are willing to pay for. Which, if for no other reason than that, makes the company's moves worth watching. – Jesse Freund

Release: Summer. Dow Jones Interactive Publishing: on the Web at bis.dowjones.com/.

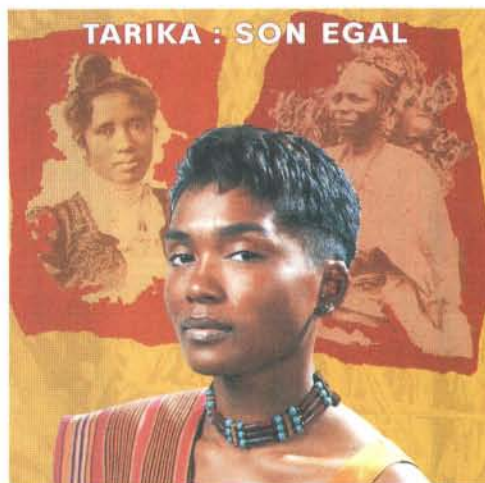


Tarika

Son Egal
Xenophile

In the face of a truth-averse régime, Madagascar's premier roots group offers a subversive dose of veracity. At Tarika's core lie sinuous, intricate melodies from an ensemble of strings whose Malagasy names (*valiha*, *marovany*, *jeju voatavo*, *kabosy*) belie teasingly familiar evocations of mandolin, zither, and dulcimer. Conversely, a light-fingered virtuosity transforms violin, guitar, and electric bass into indisputably indigenous instruments. Above the strings, exquisite polyphonies sweep from strident to lush and hint broadly at Malagasy culture's ancient links to Indonesia. Supple lead vocals – especially from Tarika's guiding spirit, Hanitra – anchor this harmonic intensity, while burbling rhythms propel it irresistibly forward.

Tarika's exuberance, however, arrives on a grim anniversary: 50 years ago, French colonists brutally quelled a Malagasy uprising with troops imported from France's other African possessions. Descendants



of these soldiers, known as "Senegalese" for where they trained, live in Madagascar still, demonized by officially sanctioned racism and ignorance. While there's a cruel logic to scapegoating today's Senegalese, there's little sense in the government's intent to erase 1947's bloody events from the country's memory. Tarika ensures that won't happen: throughout *Son Egal*, the group maintains a sensitive balance between celebratory sound and heartrending epiphany.

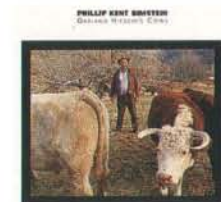
From the elegiac "Sonégaly" to the upbeat "Diso Be," several tracks relate Hanitra's search through remote villages, crumbling archives, and the Internet for records or witnesses of those nearly forgotten horrors. Such harrowing revelations could be corrosive when wielded by less artful historians, but Tarika makes of them a bracing tonic, folding them into an optimistic aural blend, its therapeutic mission underscored by the presence of Senegalese musicians. Like all outstanding protest music, Tarika's raises the consciousness while it quickens the pulse.

— Eamon Dolan

Papas Fritas

HelioSELF
minty fresh

The second disc from this Massachusetts twee-o delves even further into delicate anthem pop. Guitarist Tony Goddess calls himself a "head-phone listener," and his crafty shoestring arrangements are stereophonic proof. Vocally, the Papas revere The Beach Boys' open-voweled harmonies and the hokey clichés of timeless teen radio: "Sing About Me" is a Replacements-style raver that updates The Supremes' "Come See About Me." Goddess, bassist Keith Gendel, and drummer Shivika Asthana all sing airily, lending *HelioSELF* a flower-powered weltanschauung rarely witnessed without winks and nudges. — James Sullivan



Phillip Kent Bimstein

Garland Hirschi's Cows
Starkland

Using simple sampling and postminimalist repetitive techniques, Bimstein creates works that are quirky and thoroughly engaging. Reinforcing found melodies, rhythms, colors, and textures, he molds materials into compositions. Bimstein's whimsical spirit manifests itself in "The Door," a tone poem built entirely upon samples of a squeaky door, and shines on the title piece, "a concerto in three movements." The voice and stories of farmer Hirschi – electronically processed, along with the cries of his cows – are coupled with a synthesized accompaniment.

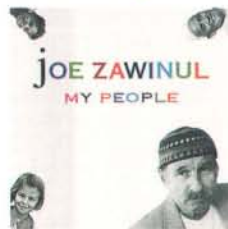
— Dean Suzuki

Joe Zawinul

My People
Escapade Music

For more than two decades, synth wizard Joe Zawinul has melded Third World elements into a jazz/fusion/funk context. Cofounder and keyboardist of the groundbreaking entity collectively known as Weather Report, Zawinul has lately teamed with a plethora of international musicians (those assembled for this project include Alex Acuña, Salif Keita, and Trilok Gurtu) to create a recording that is simply manifest destiny. Refreshingly uncomplicated, *My People* represents world beat in its most evolved state – proof that, decades later, Zawinul is still making good use of his musical passport.

— Chris J. Walker



Lamb

Lamb
Mercury

Louise Rhodes's folk vocals and partner Andrew Barlow's complex drum and bass rhythms form a foundation for this debut of wildly progressive pop music. *Lamb* is full of seemingly incompatible sounds and potential contradictions – horns and string bass, for example, alongside tablas and ambient electronic pulses – but songs such as the punishing "Lusty" and the exotic "Gorecki" sound so gorgeous that their individual parts are inconsequential. Bridging English folk and underground club traditions is a considerable feat; *Lamb* makes it sound like the most natural thing in the world.

— Scott Taves

Third Rail

South Delta Space Age
Antilles/Verve

Yes, children, the electric sky-church still exists, and James Blood Ulmer is calling us to worship. With a propulsive guitar style and preaching, mush-mouthed vocalismo, Ulmer leads this all-star ensemble through a comprehensive discourse in future blues. Featuring the robust instrumental accompaniment of Bernie Worrell, "Zigaboo" Modeliste, and Bill Laswell, Ulmer crisscrosses the chitlin circuit with fatback organ, marching percussion, and an oozing, bassy bottom. A suitably indelicate testament to a rich and earthy legacy, *Space Age* integrates gospel swamp ritual and primal field holler.

— Mitch Myers



Autechre

Chiastic Slide
Warp

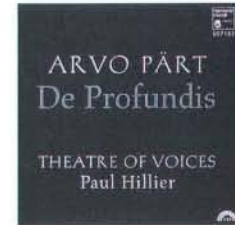
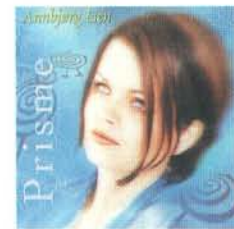
It's no coincidence that *autechre* is reminiscent of the word *auteur*: Sean Booth and Rob Brown produce techno that stands out like the improvisations of classical virtuosos. The pair's skill lies in tweaking the familiar, giving mechanical sounds orchestral breadth and imbuing traditional strings with an unnerving air. On this fourth release, Autechre takes its oblique acoustics one step further, changing the relationship of beat and melody with each successive song. *Chiastic Slide* ends with the soothing "Nuane," in which Autechre toys with emotion and rhythm on a macrocosmic scale. Dance music for the troubled psyche. — Dan Sicks

Annbjörg Lien

Prisme
Shanachie

What is it with these Scandinavians? They've erupted like a musical Viking horde, reinventing their musical traditions and dispatching them to conquer the globe. Take Annbjörg Lien: her sound might be rooted in the medieval tonalities of the Hardanger fiddle, but she's equally happy to take a stroll through acoustic clubland or shoot into the chilled-out ambience of space. Hers is the new folk, umbilically linked to the past but with a completely fresh attitude, where current sounds are as relevant as those from the last century. Lien will undoubtedly commandeer the future as well.

— Chris Nickson



Arvo Pärt

De Profundis
Harmonia Mundi

This anthology of choral works by Estonian-born composer Arvo Pärt will move your ear in remarkable ways: toward simplicity, toward spirituality and inner peace. Recorded in churches with organ accompaniment, Paul Hillier's fine Theatre of Voices performs nine pieces ranging from somber, sacred chants to jarring contemporary harmonies. Throughout, voices fold and dovetail like slowly moving dancers, sounding chords of celebration, sorrow, fright, and rage. In an increasingly electronic world, *De Profundis* reminds us that our original acoustic instrument is still capable of the greatest emotional range. — Colin Berry

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The entertainment & technology industries have now tied the knot with many emerging parallel systems of learning independent of the educational bureaucracy.

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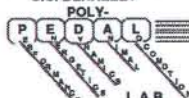
DEPARTMENT OF INTEGRATIVE BIOLOGY

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 Department of Integrative Biology
 University of California at Berkeley
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March 1, 1997

TED7

Richard Saul Wurman,

I can't thank you enough for inviting me to speak at and attend your conference!!! It was an experience I will never forget.

TED is the end-product of evolution you always hoped for! It's that breath of fresh air after rising out of the hypoxic gunk. It's simply beyond description. It was compelling, stimulating, insightful, emotional, eclectic... I am certain you heard this before. Where else could I have been offered funding for my research from the government, the use of the San Diego Supercomputing, able to discuss the possibility of developing a more sensitive laser scanner, learn about small MNR, been invited to discuss biobots on cable television, asked for data by an animatronics company, asked to be interviewed by a design magazine, invited to give a lecture on biology/motion as art and urged to come visit Microsoft? Listening to Li Lu - there are no words.

I just wanted to formally thank you for the introduction and your little video before my talk.

Thank you for taking the time to construct such a masterpiece of a meeting!

Sincerely yours,

*Bob **

Robert J. Full
 Chancellor's Professor
 Integrative Biology

*Bob Full's presentation was one of more than 50 & was only for 15 minutes.

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REGISTRATION

TED/Technotainment will be held in the SONY-IMAX THEATRE @ 68th & Broadway & begins with registration 6:00–10:00 pm on Wednesday 24 September with conference sessions running from about 8:00 am–7:00 pm Thursday 25 September – Saturday 27 September.

\$2500 check/VISA for attendance at all sessions • **\$2750** including CD-ROMs • **\$100** fee for substitutions prior to 1 September 1997 – no substitutions thereafter • No refunds for cancellations at any time, for any reason • Registration at conference with photo ID

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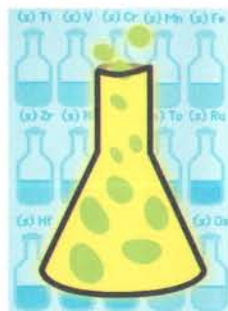
TEDX MONTEREY CALIFORNIA
 23–26 February 2000



Combustible Edison

When I was a kid, I had a Gilbert chemistry set. I didn't really learn a lot about chemistry, but I did manage to make some kind of purple substance that, when hit with a hammer, made a very satisfying explosion.

I don't need that set anymore: now I have a CD-ROM called *ActivChemistry*, a simulated laboratory for college students. Although a hammer is not included, I could probably make that purple stuff if I could remember what it was, and I can still make satisfying explosions with a virtual Bunsen burner and faux electrical switches. This, of course, satisfies the adolescent male in me.



SimLife for chemists.

The adult in me likes the hard science. In addition to tutorials by scientists, *ActivChemistry* contains a simulation engine designed by *SimLife* creator Ken Karakotsios. Just as in the real world, an infinite number of experiments is possible. I can make complex compounds, look at them in different ways, and watch them react (they can shoot off ionized electrons, for instance). The laws of quantum physics are built in, and there's an electron gun for bombarding molecules. Best of all, cleaning up the lab is easy — just Quit. — Rob Swigart

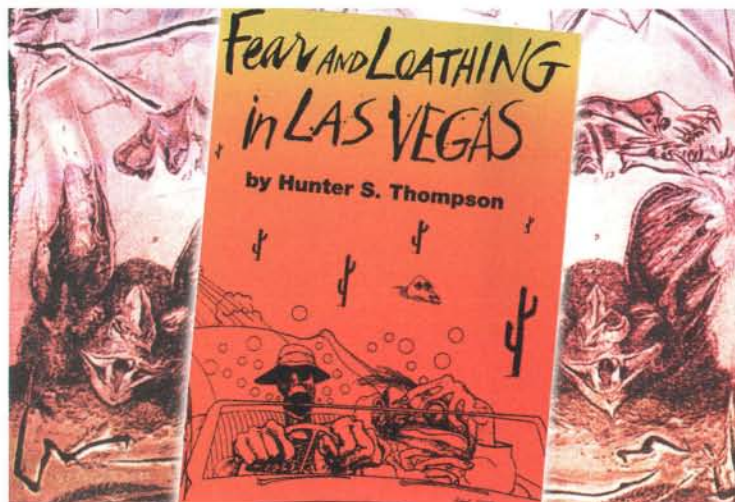
ActivChemistry: US\$19.95. Benjamin/Cummings: (800) 322 1377, on the Web at www.awl.com/bc.

Old New Journalism

"He who makes a beast of himself gets rid of the pain of being a man," mumbles Hunter S. Thompson, teeing off a new dramatic audio CD adaptation of *Fear and Loathing in Las Vegas*, his infamous tale of fast cars, drugs, consumer excess, and good old-fashioned dope paranoia. Thompson has been making a beast of himself in public for longer than some of us have been on the planet, and in the process he has changed the face of journalism.

The so-called gonzo school of feature writing, pioneered by Thompson's semi-house-trained rants, makes the journalist as important as the story. *Fear and Loathing* (for those of you who have been sheltered from this particular slice of the psychotic '70s) tells the story of a road trip to Vegas to cover the Mint 400 off-road race. Duke (Thompson's alter ego) and his 210-pound, mescaline-guzzling Samoan attorney manage to miss the event entirely, and spend an indeterminate period of time tripping and screaming their way around the desert. This is journalism, people, but not as we know it.

Hard to believe it's been a quarter of a century since *Fear and Loathing*



Pure audio dope.

ing first appeared as a two-part *Rolling Stone* article. Impossible to believe that a dramatic adaptation could be anything other than a lame cash-in on the anniversary. Amazingly, it works.

This is mainly due to the superb cast. It's laconically narrated by Harry Dean Stanton, who somehow is the only person you could imagine doing the job. Übercool director Jim Jarmusch and character actor Maury Chaykin play journalist and attorney, locked in a constant shouting match made more bizarre by their tendency to wave knives at each other and see giant lizards in hotel lobbies.

An atmosphere of true madness is maintained throughout, leavened with nice touches like *Rolling Stone* founder Jann Wenner playing, er, the *Rolling Stone* editor who gives Duke "total credit" for expenses — and a white Caddy — when he hires the writer to cover the District Attorney's Drugs and Narcotics Conference.

It's a helluva road trip, and far more fun than any other audiobook I've ever heard (especially in the car). Just put your foot to the floor, and if the cops stop you, make sure the guns are hidden under the seat. — Hari Kunzru

Fear and Loathing in Las Vegas audiobook, by Hunter S. Thompson: US\$16.99. Island Records: +1 (212) 333 8000.

A Most Dangerous Professional

Dutch architect Rem Koolhaas has proven twice — with *Delirious New York* and *S,M,L,XL* — that he can engineer dazzling and grandiose books as well as striking and bawdy structures. Over the last year, he has also proven quite adept in the role of celebrated artist. A fountainhead of paradoxes, artspeak, and glib-yet-acute observations, his mode, writes editor Sanford Kwinter in *Rem Koolhaas: Conversations with Students*, is "to convert optimism into danger and make that danger speak."

Yet, if anything, Koolhaas's splashy press reception kept me from fully appreciating his work. Between *The New York Times's* swoon and his confessional moments in *S,M,L,XL*, he risked becoming the Henry Rollins of urban planning. After reading Kwinter's collection, however, I've become one of his pupils. *Rem Koolhaas*, a thin, handsome, paperback that a young architect at my corner bar insist I read, contains a witty lecture, a smattering of Q&A, and Kwinter's essay, "Flying the Bullet, or When Did the Future



Koolhaas: armed with rhetoric and urban plans.

Begin?" Like Koolhaas's own books, it mixes text with graphics; unlike his works, which this book has helped me better appreciate, it distills rather than inflates the architect's thoughts.

The takeaway from conversations is, I admit, somewhat elusive. It is not a quick and easy lesson, nor does it nicely illustrate the habits of a highly effective person. Koolhaas grasps the rhetorical and practical advantages of systems out of control. Like René Magritte, he likes it surreal. And, as critic Ian Buruma has pointed out, Koolhaas has made global cultural confusion an asset. He's at ease with contradictions. He likes them.

Here's what I can say for sure: *Rem Koolhaas* offers a way to pierce the hype surrounding its subject and may inspire you to look at your own profession the way he views architecture: as a will-o'-the-wisp, as something you want unknowable so that you may continue to make discoveries. — Brad Wieners

Rem Koolhaas: Conversations with Students, by Sanford Kwinter (editor) and Sze Tsung Leong (designer): US\$14.95. Chronicle Books: +1 (415) 537 3730.

Copy, Paste

Any writer or editor who has been around for a while can attest to the joys of Copy and Paste commands. Unfortunately, they haven't evolved much over the years. As an editor for an Internet directory, I spend a large part of my day shuffling around Web addresses, titles, and text. While I switch endlessly back and forth between programs, I curse Apple for not enabling me to copy more than one item at a time.

But praise be to generous programmers. On Shareware.com, I discovered a 293K system extension that expands my copying capabilities tenfold. CopyPaste's nifty text-processing tools let you shift case, tab, or insert text files, pictures, and sounds into a clipboard – the floating pal-



Shareware wow.

ette keeps track of what's where. Even neater is the clip archive, which drops copied items into a folder on your desktop – fabulously convenient for online researchers.

But why does CopyPaste enable you to insert dates according to the Baha'i calendar? Because Baha'i is what motivated co-creator Peter Hoerster (with designer Julian Miller) to program this product. Browse the help section, and you'll find an invitation for the faithful to email him. Whether you're converted or not, it's a blessing for any writer or editor.

—Debbie Elkind

CopyPaste 3.3.1 shareware for Mac: US\$20. Julian Miller/Script Software: +1 (916) 546 9005, email julian@sierra.net, on the Web at members.aol.com/copypaste1/index.html.

TOM GARDNER, who founded The Motley Fool investing forum (www.fool.com/) with his brother David, is working on his second book, *You Have More Than You Think*.

Downsize Your Debt: How to Take Control of Your Personal Finances, by **Andrew Feinberg**. "This is a personal-finance guide to managing your debt: how to pay it down, and renegotiating with creditors. The Web potential of this book is huge. For instance, credit card rates have risen to 18.5 percent, but only high-risk borrowers should be paying that rate. Online, people would be able to share experiences and get advice. Companies won't be able to benefit from customers' ignorance."

How to Drive Your Competition Crazy: Creating Disruption for Fun and Profit, by **Guy Kawasaki with Michele Moreno**. "We think of this book as incredibly foolish. Kawasaki argues that companies should focus on serving their customers rather than on what their competition is doing. Though he is an Apple Fellow, that company has not been applying his approach. Ironically, his message is exemplified by Microsoft, which persistently asks its customers what they want and tries to improve its products for the average person."

PHILIPPE KAHN, of Borland International fame, cofounded Starfish Software in 1994 and lives in California's Santa Cruz Mountains.

Music scores. "I play jazz. It's my form of meditation, a workout for the soul. So I listen to a lot of jazz and transcribe and play along. Trane and Bird are the masters. Hearing their solos is better than reading a



Tom Gardner



Philippe Kahn



Allen Whitman

book – it's instant poetry. On my nightstand, I have a reprint of Johann Sebastian Bach's original score for *The Art of Fugue*. I love to see his handwriting and hear the music in my head. It's magical. It's as if he sent me a personal note."

One Hundred Years of Solitude, by **Gabriel García Márquez**. "I first read it in French. When I came to the US I tried it in English, which prompted me to reread the French version. And now I'm trying – for the second time – to read it in Spanish. It's a different experience every time. I should have started with Spanish, though. In its original the language sounds like flamenco – passionate and imaginative and full of mystical energy."

ALLEN WHITMAN plays bass for *The Mermen*, cowrites a column in *EQ* magazine, and makes a great spaghetti sauce.

Pharmako/poeia: Plant Powers, Poisons, and Herbcraft, by **Dale Pendell**.

"The book is written for the modern-day alchemist; it combines the heart and the mind, science and the soul. Pendell writes beautifully and has the facts to back up his ideas. This is one of the best and most useful books I have ever read. It helped me quit smoking."

Anything by **Salman Rushdie**. "Arguably one of the greatest literary geniuses alive today. Certainly one of the best storytellers. Rushdie is absolutely brilliant and very funny; his social commentary and observations of the human condition are written with a sense of humor. My favorite is *The Satanic Verses*, though I'm slightly embarrassed to admit it. I haven't read *The Moor's Last Sigh* yet. I'm waiting for the right time. To me, a good book is a banquet – it fills me the way a great meal does. A great book should be savored like a box of chocolates."



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Groupware

Groupware technology is following the rarest arc in high tech: steadily downward. While most software is becoming smarter (my wordprocessor can balance my checkbook, for god's sake), groupware applications keep aiming lower and lower. We have gone from the early days of promised real-time cooperative work to the glory days of Lotus Notes to today's inane "discussion groups." The fact that Netscape's new groupware strategy is based on NNTP - the decrepit, 13-year-old Usenet protocol - tells you just where the market is headed.

MEMS

There is a nagging suspicion among industry opinion makers that microchips aren't sexy anymore. Biotech and cloning could be the next big thing, these experts grudgingly agree, but who wants to learn a whole new field? So it's no surprise that industry pundits are instead eyeing microelectromechanical systems (MEMS), hybrid chips that combine tiny motors and sensors with smart circuitry. It's new but familiar technology. Besides, they argue, Darpa is heavily funding MEMS research - and Darpa brought us the Net. True. But Darpa also brought us 30 years of artificial intelligence boondoggles.

This Month's Overhyped Memes	Hype Level	Position Last Month	Expected Lifetime
Groupware	👇	0	9 months
MEMS	👇	👇	4 months
Digital Certificates	👇	👇	11 months
Intel's MMX	👇	👇	2 months
Opener Than Thou	👇	0	3 months

👇 = Embryonic meme 👇 = Meme on the rise 👇 = Mass-media meme 👇 = About to die from overexposure

HYPE LIST



Digital Certificates

Everyone talks about how dangerous and insecure the Net is, but I'm about ready to walk around naked. It's either that or drown in a sea of code. I've got my PGP key, seven login sequences and passwords, four digital IDs, and a plethora of free VeriSign digital certificates. I can prove my identity so many different ways it would make a banker blanch. My email is so secure, not even the NSA can read it. But if I devoted my brainpower to remembering what I need to do, instead of what my passwords are, I might be able to actually get some work done.

Intel's MMX

While most microprocessor developers are exploring VLIW, IRAM, and other modern techniques, Intel is just discovering vector processing - an approach that went stale in 1972. While PowerPC is doubling its chip's clock speed, Intel promises a meager 10 to 20 percent improvement. We're talking, of course, about MMX, the much-hyped, microscopically improved addition to Intel's Pentium flagship. As Andy Grove likes to say, "Only the paranoid survive," but fear seems to have Intel paralyzed.

Opener Than Thou

Given the overwhelming success of TCP/IP, vendors are falling over themselves to promote their solutions as equally "open." But most developers really want to lock you in with a proprietary solution. Here's a short dictionary to help translate the resulting doublespeak: An open standard "with a few proposed extensions" is the same thing as "proprietary." An open standard that is "sponsored" by Microsoft is "proprietary." And an "enterprise-wide open standard" is one that is specific to a vendor's line of products - which means "proprietary."

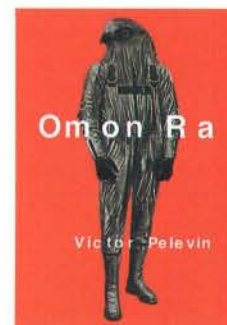
- Steve G. Steinberg (hype-list@wired.com)

Seeing Stars

As my plane flew over the former Soviet Union en route to Tokyo one starry night, I opened Victor Pelevin's slim, mysteriously titled novel *Omon Ra*, recently translated from Russian into English (and German, French, Dutch, and Japanese).

Remember when launching satellites was as heralded as sending wireless email? Pelevin, a thirtysomething Moscow novelist and voice of postglasnost hip, captures the absurdity of overromanticizing technology in this clever flashback satire, in which cosmonaut Omon Krivomazov is ordered to kill himself after piloting what is supposed to be a robotized expedition to the Moon.

Pelevin lavishes the reader with elegant description ("I ran outside and stood there



Postglasnost hip.

... swallowing my tears as I stared up at the bluish-yellow, improbably near orb of the moon in the transparent winter sky", and he pokes subversive fun at '70s political culture (Henry Kissinger hunts men in bear costumes during a visit to Russia).

What makes *Omon Ra* an intriguing read is witnessing the drama through the protagonist's wide-eyed point of view. Curious and sincere, Omon ceaselessly questions how things work, hungrily analyzing his surroundings - from the illogically small supply of rations in his spacecraft to the ubiquity of macaroni stars in the cafeteria soup.

- Reena Jana
Omon Ra, by Victor Pelevin (translated by Andrew Bromfield): US\$23. Farrar, Straus and Giroux: +1 (212) 741 6900.

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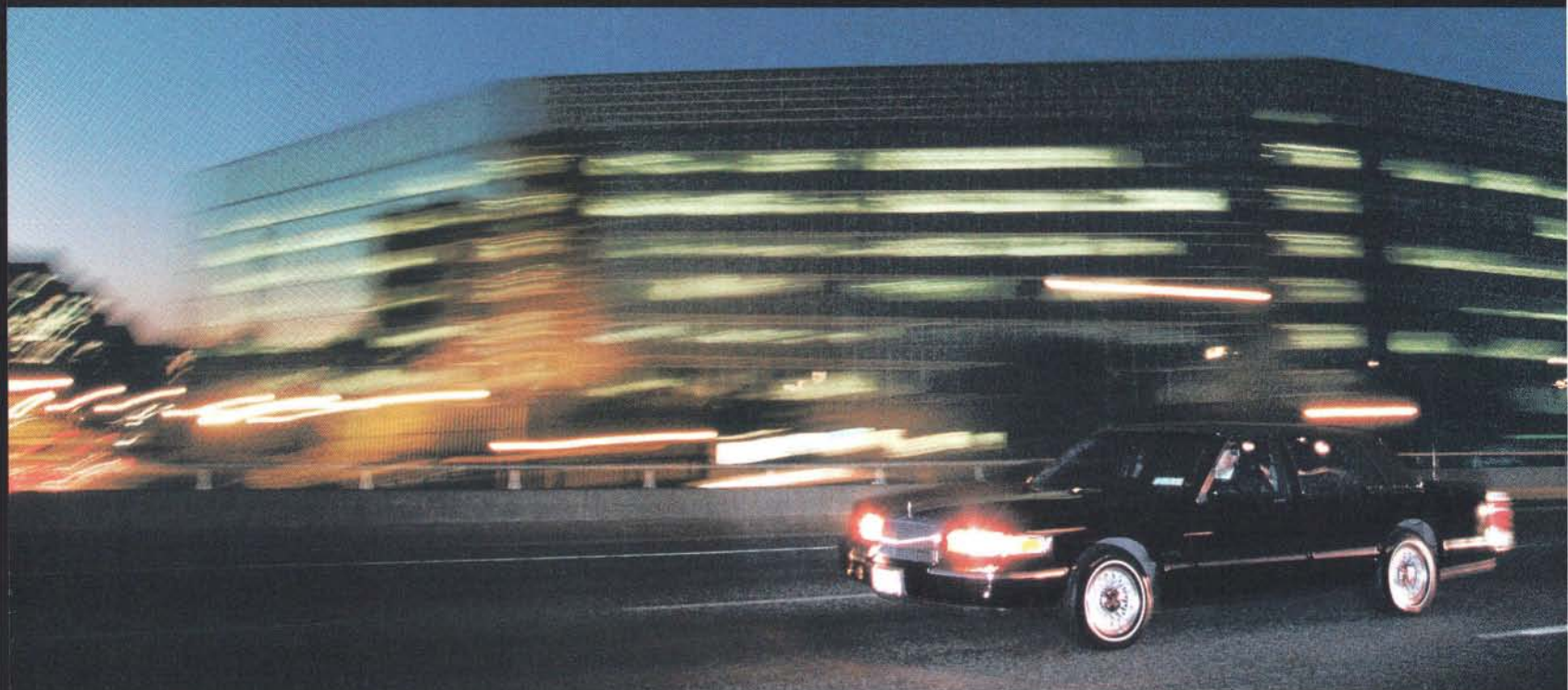
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Ride On!

Welcome to the World Ride Web, where the Bettys and Bobs of mountain biking flex their full-suspension savvy, talk titanium, and give blow-by-blows of their latest biffs. Hardcore bikers have singletrack minds, but you'd never guess it from the diversity of Web sites devoted to this sport. Rather than ride with the pack, blaze a trail of your own: a great place to start is www.cycling.org/. This global cycling network serves as a clearinghouse of links to advocacy groups, racing pages, and even bike-friendly vacation havens. If you know what you want but don't know where to find it, Pete's Bikindex (www.pond.com/~mudboy/jsindex.html) – with more than 1,850 links – is the ticket. You can track down a list of organized trips in your area, or, for hours of stationary fun, check out Chris and Pete's SpeedCalc Bicycle Gearing Chart and rpm-to-mph calculator.



www.mtbr.com/

Of course, the fat-tire freedom trail can get expensive, and as the sport becomes more commercialized, consumers must be shrewd. Not sure whether to throw down US\$190 for a Shimano XT crank? Check out Mountain Bike Review (www.mtbr.com/). Bursting with product reviews by bikers for bikers and organized by category, MTBR's 8,000 critiques of 700 products include a photo, price, and link – in addition to riders' postings and ratings. The Marketplace section draws those buying, selling, or seeking virtually any cycle-related item – the perfect forum to clear your garage of all that tired gear. The more zealous bikers flock to this site for a daily hit of Passion, where visitors can drum up sympathy for yesterday's taco ("I taco'd my wheel, and it cost me a hundred bones").

Need a translator? Try world.std.com/~jimf/biking/slang.html to figure out why a betty may take offense if you comment on her bolt-on but will gladly show you her giblets. Ross Finlayson's site at xenon.stanford.edu/~rsf/mtn-bike.html also packs some great howlers (including a prayer: "Our Father which art in Moab/ Mountain bike be thy name/ To thy trailheads we come/ Thy maintenance be done ...") between straight-shooting information like "bunnyhopping for the complete spaz" and singletrack tips for beginners.

Two online publications make an excellent supplement to regular rides. You could give your bike a complete tune-up while waiting for the server at GearHead (www.gearhead.com/), but the RealAudio interview with Specialized bad boy Shaun Palmer is worth it. The site also lists race standings and covers breaking industry news. *Dirt Rag* (www.cyclery.com/dirt_rag), meanwhile, promises something more, well, earthy than mainstream mags: "The editors are not Gods," it declares, "and *Dirt Rag* is not a bible." (Amen!) Not only does this zine break the traditional mold, it offers an alternative to the alternatives. Issue 56 features a chat with suspension guru Paul Turner, a story about the future of free trails, and a look at what manufacturers think about warranties.

Even meatier fare can be found at www.crl.com/~boeschen/Bike/bike.html. Download one of D. Railleu's two novels, *Interview with the RADAR Ranger* or *Singletrack*, for some good trailside reading. If you're not familiar with the Northern California setting, this site's topographical map and photos give you a good idea of what you're missing.

Looking for stellar mountain biking sites on the Web is a lot like trying to find the perfect line down a path crowded with weekend warriors – once you get a taste of the goods, nothing compares. You may have to pogo over a few stunned poseurs, but hang on, relax, and let the trail take you home. – Kristine Kern (kkern@wired.com)



www.cyclery.com/dirt_rag



www.gearhead.com/

A Matter of Degrees

How'd you like to discover that your loan shark's brother has a high-level position at a casino? While at times networking gems like this surface in casual conversation, sixdegrees no longer leaves that to chance. The site automates the linkage game, making it more efficient and more accurate.

Inventor Guglielmo Marconi once surmised that by the time the wireless telegraph connected the country, we'd be able to find anybody on the planet through the interrelationships of 5.83 people. Based on this theory, sixdegrees uses the list of people you know to connect you with those they know and so on. You fuel your networking vehicle by signing up and referring a friend.



www.sixdegrees.com/

Sick Stick Scenes

Get cut off by somebody on your way to work? Urban living tends to bring out the worst in us – causing postal workers to point automatic weapons at you, salespeople to ignore you, and middle-

class teenage punks to curse you for not giving them spare change.

Stick Figure Death Theater can help you to blow off that violent steam, without the messy cleanup. Three scenarios – the gun, the car, and the exploding head – reenact

horribly savage deaths in simple stick-figure style.

If you have a browser that accepts animated GIFs, you are in for minutes (this is the Web, after all) of fun.

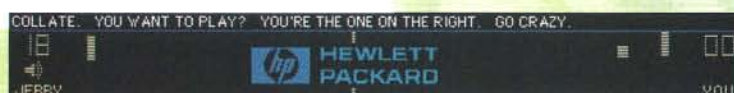


www.calvert.com/sfdt/sfdt.html

Image Is Nothing

Conventional advertising isn't about interaction, it's about image. But online, most banner ads simply shout "Click me!" No style, not much substance. So it was surprising to see that Hewlett-Packard had ignored the status quo and eschewed typical lowest common

denominator Web design principles to build a Shockwave banner that plays *Pong*. And that's all it does. No bright colors, no jerky, animated sales pitches. Just a little ball and your paddle against the computer's. It could be the best banner ever, if only they'd make it a little bit easier to win.



www.hp.com/go/mopier



www.eskimo.com/~jessamyn/barth/

Transcendent Weirdness

If you've never sampled the dark and appealing literary hors d'oeuvres of Donald Barthelme, you'd better scamper off to Jessamyn West's proper little shrine.

Barthelme's fame as a fiction writer sprouts from his arid, cutting humor and his almost journalistic approach to the surreal. West's homage collects all known online Barthelmania and represents the only site officially sanctioned by the estate of the author himself. Browse with vigor, and you will be rewarded.

It's All in How You Look at It

Forget costly demographic studies – the best place to finger the average netizen's pulse is at Voyeur, a Peeping Tom's dream that displays randomly selected real-time search subjects, 20 at a throw.

Refreshed thrice a minute and doglegged off Magellan's search engine, the site cracks a gritty window on the Web's dark, oft-illiterate heart: sure, there's the expected "riverdance tickets" and "bongs," along with the predictable "thong bikinis" and "sex," but you have to wonder about

"neon bowling" aficionados or the poor sap investigating "death by inhibition." "Bomb," "pipe bomb," and "gas bomb" popped up one night, as did "licked his nipples," "click here to vomit," and the mysterious "hydrogen embrittlement." Typos and plain old bad spelling are indistinguishable – but "Bermuta Triangle," "scollar ship," and "marajauna" offer telling clues. These are the topics that pique a generation due to inherit the planet?

voyeur.mckinley.com/voyeur.cgi#voyeur?1

Double Double Toil and Trouble

The saying "Those who walk in love and truth shall grow in honor and strength" greets each connection to The Witches' Voice. Grounded in Boston, Massachusetts, the undiluted threads of digital magic that make up this informative cyberspace offer a profound mythos for our increasingly obvious interconnecting global/universal web of life. A news and education network for witchcraft as a pagan religion, this site is rich with compassion, honoring the sacrifices of the past. Elemental texts like the Witches Rede and the Three-Fold Law share the spotlight with



www.witchvox.com/

the Religious Freedom Restoration Act, the Advanced Bonewits' Cult Danger Evaluation Frame, stories of modern witch persecutions, and a Witchcraft FAQ. Plunge into the hyper-techno spell of electronic modem handshakes and know the light of pure and true Magick.

Random Sound Byte o' the Month

Check it out:

queen-fip.com

[/AUDIO/WAV/bicycle.wav](http://AUDIO/WAV/bicycle.wav)

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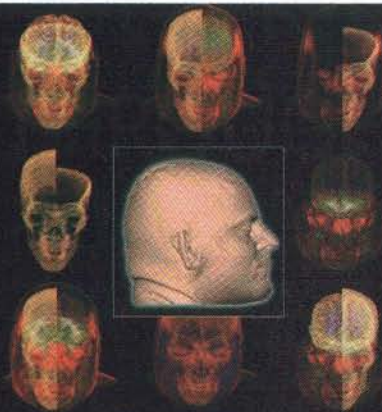
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In the Zone

◀ 134 the ice in February and at one point grew a goatee to cover the stitches. "We have software and databases that deal with every single sport, every single league in each of those sports, every single team, every single player. Every single game and scoring event that happens in any event at any time is live, within a few seconds."

And that's just the *back* end. The real fun happens out front, where, during March, as the parsers were struggling to keep up with every jump shot and turnover in the 64-team NCAA tournament, SportsZone put even more daylight between itself and the rest of the online sports pack – CBS SportsLine, MSNBC's Sports (its most popular site), and other big-time entries from *USA Today* and CNN.

That's when it launched Starwave Direct, a push-media channel that works with Microsoft's new Active Desktop, Netscape's Constellation, or SportsZone's own cus-

two teams make a trade or when it was announced the other day that the Patriots are going to pick up the Jets' third- and fourth-round picks this year, second-round pick next year, and first-round pick in 1999 in exchange for allowing Bill Parcells to coach, the first thought that goes through a sports fan's mind is, Who got the better deal? Who made out?" says Reiss.

"But it's amazing how little traditional sports media looks at it the way the sports fan looks at it," he adds. "Fans want to be experts; they want to tell you everything you want to know about Bill Parcells. But I don't know how much the traditional sports media really answers the basic questions the fans have about the way things work and what's behind that. The traditional sports media has more and more worked as a relatively detached filter of information."

Hence another SportsZone mission: to make subscribers, 95 percent of whom are male and whose average age is 24.3

The goal is to offer fans "the ultimate buffet," says Reiss. "What it comes down to is how much of it we can put under the hood."

tom-built client. The idea: a system that infers – from watching where you go on the site, as well as a site map of your preferences – that you follow, say, anything involving hockey and only the 49ers in football, and that you don't care about auto racing or baseball drug busts.

It then transparently – there's that word again – feeds you the stuff you want, when you want it. No muss, no fuss. Says Naughton, "Most Web sites scramble to keep up with each new announcement, pushing unproven, unstable, and sometimes unusable technologies on unsuspecting users. We understand the difference between good technology and specious hype." Modesty doesn't seem to be part of Naughton's current playbook; Slade calls him a predator – an epithet pretty close to the ultimate SportsZone compliment.

In fact, no one at SportsZone is shy about the site's underlying ambition: to reinvent sports coverage. Publisher Geoff Reiss says it's a matter of switching viewpoints. "When

years, part of the story. They'll send a reporter into a locker room after an NBA game and open the questions up to online viewers. Anything you want to know from George Karl? The reporter – a SportsZone staffer or an ESPN TV regular on loan – will relay Karl's answers via laptop to the editors in Bellevue, who post them online. "Can we give each fan a distinct voice? No, that's not realistic," Reiss says. "But can we make it a pretty high priority to create opportunities for fans to be looped in? Yes. And it's an interesting part of the story that, say, 60 percent of the fans – a lot of whom are as knowledgeable as anyone covering the sport – think the Angels won in this trade or that the Dodgers got screwed."

Andy Scott, the 26-year-old associate publisher – his sport is basketball – puts it this way: "We just kick back and say, 'What do we want to see?'" That's the approach that spurred SportsZone to develop a sophisticated polling applet

that enables users to select, for example, whom they think deserves to be baseball's highest-paid player. That was the question posted 20 minutes after Barry Bonds's record-breaking \$11 million annual contract was announced. After Dennis Rodman was suspended for 11 games for kicking a photographer, the question was, Will he be suspended again by the end of the season?

The kick is that the poll isn't just interactive – it's real-time. You just select your answer and hit Submit Vote. Within two minutes, a results window pops onto your screen, reflecting your vote and showing how it stacks up against other fans' choices. For the salary poll, 27,699 fans weighed in: 49.7 percent gave the nod to Ken Griffey Jr., against only 16.3 percent for Bonds. As for Rodman, 57.6 percent thought he'd get another heave-ho. Sure enough, he did, a couple of weeks later, for slapping another player in the crotch.

Another hot feature is SportsZone's sortable stats, which lets a user custom-build what amount to dynamically updated sports spreadsheets. "Every time you hit a page, the tool can look at the statistics for a certain player or conference or league or position, can filter it by group, and can also sort it by points per game, points per played minutes, rebounds per game, rebounds per played minute," explains engineering manager Steve Beck. That sounds harder than it is.

Using software to make things go easy is another SportsZone hallmark. The much-improved ListRanker, for example, allows users to draw up a list of, say, their all-time favorite NBA guards or their favorite college football teams of 1993, then see how it stacks up against other users' choices. Last year, this process required a lot of complicated HTML forms; now it's a Java-powered drag-and-drop.

There's even bigger game down the road: convergence with television. The site's full name isn't ESPNET SportsZone for nothing, and everyone knows that the real prize will be to amalgamate the best of what TV can do – brilliant visuals and real-time clarity – and the best of the Web: responsiveness, depth, and interactivity, one-on-one. Downloadable video highlights are already happening; streamed video is in the works. The goal, says Reiss, is to create "the ultimate buffet, the 169 ▶

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By joining the Wired reader panel, you are helping us to continue to bring you the most dynamic magazine available. Over the next year, we will send you a series of research surveys. Your responses will be essential as they will contribute to further understanding our readers. Responses to the attached survey will remain strictly confidential. As a thank you for responding to this survey, we will enter you in a drawing to win a PalmPilot™ Professional or one of 25 Wired CD cases.

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- ☐ Subscriber
- ☐ Newsstand
- ☐ Friend/Relative
- ☐ Other (Please specify) _____

2. What is your gender?

- ☐ Male
- ☐ Female

3. What is your marital status?

- ☐ Single, never married
- ☐ Married/Living with Partner
- ☐ Separated/Divorced
- ☐ Widowed

4. What is your age?

- ☐ under 18
- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-49
- ☐ 50-54
- ☐ 55-64
- ☐ 65 or older

5. What is the highest level of education you have completed to date? (Please check one only)

- ☐ Graduated high school
- ☐ Attended college
- ☐ Graduated college
- ☐ Graduate degree
- ☐ Doctorate

6. What was your approximate household income, before taxes, for 1996? (Please include income from all household members and from all sources, including salary or wages, profits, interest, dividends, etc.)

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 - ☐ \$50,000-59,999
 - ☐ \$60,000-74,999
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 - ☐ \$100,000-149,999
 - ☐ \$150,000-199,999
 - ☐ \$200,000-299,999
 - ☐ \$300,000-399,999
 - ☐ \$400,000-499,999
 - ☐ \$500,000-999,999
 - ☐ \$1-1.9 million
 - ☐ \$2 million or more

7. What is your title or occupation?

- (Please check one only)
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 - ☐ Owner/Partner
 - ☐ CIO/CTO/VP of MIS/IS/IT
 - ☐ CFO/Controller
 - ☐ Vice President
 - ☐ Manager/Administrator
 - ☐ Professional (accountant, architect, doctor, lawyer)
 - ☐ Technical (non-manager, engineering)
 - ☐ Consultant
 - ☐ Clerical
 - ☐ Other: _____

8. In what department do you work?

- (Please check one only)
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 - ☐ Computer Programming
 - ☐ Consulting
 - ☐ Data/Tele/Networking
 - ☐ Education/Training
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 - ☐ Medical/Healthcare
 - ☐ MIS/IT/IS
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 - ☐ Other

9. What industry are you currently employed in? (i.e. publishing, medicine, computers, telecommunications, etc.) (Please write in)



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10. Please indicate the number of employees in your company. (Please check one only)

- ☐ Less than 10
- ☐ 10 - 24
- ☐ 25 - 49
- ☐ 50 - 99
- ☐ 100 - 499
- ☐ 500 - 999
- ☐ 1,000 - 4,999
- ☐ 5,000 - 9,999
- ☐ 10,000 or more

11. Do you maintain an office at home for either personal or business use?

- ☐ Yes, for personal use
- ☐ Yes, for business use
- ☐ No, neither

12. Do you access the Internet at home or at work?

- | | Browser | Online Service |
|--------------|-----------------------|-----------------------|
| Yes, at home | <input type="radio"/> | <input type="radio"/> |
| Yes, at work | <input type="radio"/> | <input type="radio"/> |
| No, neither | <input type="radio"/> | <input type="radio"/> |

13. Are you involved in Web site development for your company?

- ☐ Yes
- ☐ No

14. Have you ever used any of the following World Wide Web sites? Please check all that apply

- a. HotBot (Wired's search engine)
- b. HotWired (Wired's Web site)
- c. Wired NEWS (Wired's Web-based News Service)

- | | a. | b. | c. |
|-----------------------------|-----------------------|-----------------------|-----------------------|
| Yes, I use it frequently | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Yes, I use it occasionally | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Yes, I've visited it before | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| No, but I've heard of it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| No, I've never heard of it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

15. Have you ever registered as a member of HotWired or one of its sister services?

- ☐ Yes
- ☐ No
- ☐ Don't Know

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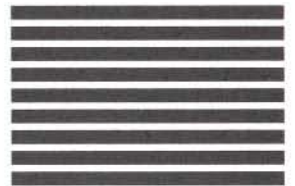


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In the Zone

◀ 168 all-you-can-eat for consumers of sports. It comes down to how easy do we make it for you, how much of it can we put under the hood."

It's the early days of March Madness, the 1997 NCAA Division I basketball finals, and Dan Shanoff, SportsZone's 24-year-old college hoops guru, is standing over a desk editor in the main SportsZone newsroom, dictating a preview for one of tomorrow's 16 first-round games. "UCLA holds a large, inside advantage," he's saying, "but the scrappy..." Someone interrupts to confirm that he's just updated the site's special NCAA front-page index to reflect the results of the Texas-Wisconsin match. Another staffer says that somebody "upstairs" doesn't like the word *index* out front, and wants a more colorful title. From left field, someone else yells out that Gordy Howe is making a comeback, but Shanoff is already back rattling off previews: "The Musketeers could pose problems for a backcourt whose play has been spotty at best..."

The NCAA championships are show time in the online sports world, and with 64 schools' worth of wired college kids craving minute-by-minute fixes, SportsZone's 15 Sun and Hewlett-Packard servers are setting records. Yesterday's was 4.9 million impressions, and today's traffic seems even heavier.

"Hey, look at this," says someone eyeing the Georgia-Chattanooga first-round game on TV. "They want to run the clock, but Chattanooga's leading scorer fouls him in the backcourt." It's an upset in the works, with seconds left in the game, and Shanoff comes over to watch. Suddenly there's a shout: "I'm locked out!" Someone else says calmly, "The server just shut down." Everyone's screen is frozen.

"It's college students pounding the system - those kids are fanatics," says Shanoff, who looks like a student himself. The good news, it turns out, is that only Bulldog, the publishing system, is down; the public servers are fine, and the automated features are running normally. Suddenly sidelined, the editing crew stands around watching the televised game. When a score is announced or an impressive play is

made, high fives go around. Ten minutes later, the system is back up, and everyone goes back to work.

Live human editors are fun, but the database and dynamic pages give SportsZone an incredible efficiency. Three-quarters of its 100,000 pages - including scores, stats, and schedules - are automated: the pages are continuously updated and sent out on the Web without encountering a human. Wire-service news stories go straight to another custom-built database. Editors make their choices from a friendly front end that shows the day's headlines; they cut, splice, or rewrite to taste, then pick a template, write a headline, and go. "It completely removes an editor from having to know HTML," says Harry Snyder, manager of the automated publishing group. "The templates allow producers to define how a page gets formatted. It describes what the page is going to look like. It's actually defining the HTML, but it's transparent to the editor." Says Beck,

them. Instead of just saying, 'I care about the NBA, give me all the NBA stuff,' you can say, 'Oh, I care about the Blazers, but not about *that* Blazer. I care about this stat, not *that* stat.'

"Because we designed the database first, we can do things in more precise and more interesting ways," Slade adds. And because we're building the client, it's got an instrumentation in it that lets us watch what you do: 'This guy never reads about hockey. I'm never going to send him anything about hockey.'"

Says venture capitalist Neil Weintraut, a partner with the San Francisco-based 21st Century Internet Venture Partners, "SportsZone is taking the consumer media experience to the next level. It's an early manifestation of one of the Internet's holy grails - machines do the work, down to the individual level."

Could push lead SportsZone away from HTML entirely? Naughton says that Web pages will continue to be part of the mix

It's March Madness, and that's show time for online sports - 64 schools' worth of wired college kids craving minute-by-minute fixes.

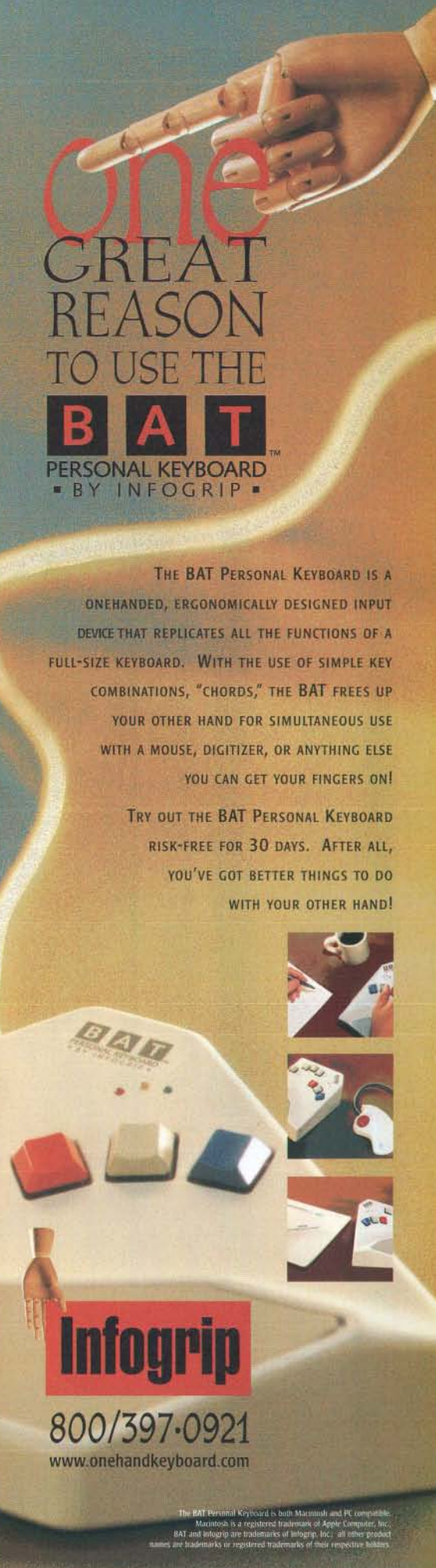
"You just hit Publish and, boom! It's out to the front page."

Most of SportsZone runs in Java, and not just in deference to Naughton. Everything is keyed to the database, which consists of executable objects preloaded with all the content needed for a particular page or feature. The system works like this: Objects wait to get all the necessary content - say, updated scores - from the wire parser. Once the objects are full, they get "published" in the system: a designated Java template pulls in the necessary content, then writes an HTML file. "The template language has some HTML in it," says Beck, "but we're basically getting away from that. It's our own proprietary language."

Starwave Direct, the new push feature, is even more heavily customized. "On the front end, there's a user experience that's almost like a next-generation PointCast," says Slade. "It has a way to change channels and drill down relatively deep inside

"because they're big traffic builders and revenue sources." But he and the SportsZone engineering crew are also writing eye-popping applications for both Active Desktop and Constellation that simply wouldn't be possible with existing technologies. Naughton jumps to a whiteboard to show an example. "Take ScorePost (a daily rundown of scores). There's a little applet that's stuck in this document," he says. "Pick it up, make it the whole world, and put documents in it - a complete inversion of the Web site. Rather than having applets stuck in documents, you have Java code that owns the world and understands it and treats documents just like they're images." Translation: stats that will do what you, the user, want.

On SportsZone's scale, that's daunting. "It's easy to push a Web site like *Slate* or *Suck*, basically a three-page Web site," says Naughton. "But with close to 100,000 pages, it's difficult to push the whole thing. The worst thing is what FreeLoader 170 ▶



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In the Zone

◀ 169 or BackWeb do, which is to take the front page and one-level-deep every link off of it." That's where big (and expensive) engineering comes in. "The thing is to be smarter," he says. "Environments like Active Desktop or Constellation or Point-Cast are generic. They know virtually nothing about the content. That really homogenizes the user experience. We need to do a lot more."

Nobody around SportsZone seems to doubt that they can do it. "We have programmers here who are doing more complex things, on a bigger scale, with sports statistics than they were doing before with, say, airline reservation systems," says Slade. "How cool is that?"

But some things are bigger than even a technojock's ego. "Our biggest problem is bandwidth," explains executive producer Jeff Day, taking a quick breather on the sidelines of a Friday intramural Ultimate Frisbee match. "Probably half our users

loaded, the Mariners down by four runs, this is what he's done before."

A little bit further down the road, Day says, "you'll be able to tell your computer or TV really specifically what your interests are. So when Chattanooga's about to upset Georgia, you get email, or a window opens up on your computer screen. Or you could even get paged on your PDA and tune in and watch it live – and you'd have synchronized live stats, even if you've tuned in at the last minute."

Those kinds of features won't come cheap, especially if the market in Internet sports broadcast rights heats up. The issue reared its head in March, during the Final Four weekend: NCAA officials barred reporters from SportsZone and other online sports-news sites from court-side in Indianapolis, in an effort to monopolize traffic for an official tournament site, FinalFour.net.

Those excluded – including *USA Today's* online division, which threatened legal action – were not amused. "You want your

With Disney aboard, one feature you won't see on SportsZone is online sports' potential killer app: instant betting.

are on their company networks and have T1 connections to the Internet. But the other half are at home and have modems. That means when we design the Web site, we're fairly restricted as to how big we can make applications and how big we can make graphics. Two or three years from now, with cable modems, more ISDN, satellite connections to the Internet, ADSL, all that, we'll be able to do more heavyweight stuff."

That can't happen soon enough for Team SportsZone. During my visit in March, streamed video was getting ready for launch. Live baseball on the desktop, and then some: You're watching the Mariners, Griffey batting against Clemens. You'll be able to click on Griffey and get all the stats. Or SportsZone might do it for you. "In real time," says Day, "we'll go to our database and be able to say, 'In this situation, against Clemens, bottom of the ninth, two outs, bases

own people at events," says Gelman, who had to scramble and run wire accounts, "the same way you'd want your own people covering the White House."

But Slade and his crew have a leg up – several of them, in fact: ESPN's backing, along with long-standing deals to produce official sites for both the NBA and the NFL. More than that, though, SportsZone has made a breakthrough on the revenue front, proving that people – or sports nuts, at least – *will* pay for the right online stuff.

Launched late last year, SportsZone Premium put a password-protected gate on many of the site's hottest features, including sortable stats, cybercasts of every NBA game, and downloadable video highlights. As a privately held company, Starwave is guarded about numbers. But Reiss calls the experiment in tiering "an unqualified success. We've got people numbering well into the tens of thousands."

In April, that translated into expo- 172 ▶

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In the Zone

◀ 170 nentially bigger numbers: after months of closed-door negotiations, Disney – already part owner of SportsZone through ESPN – paid an undisclosed sum, reportedly \$100 million, for a controlling stake in Starwave itself. The press releases went out of their way to say that Slade, Naughton, and the rest would be staying on – with suitably grander titles.

But the real payoff was a simultaneous announcement: their first job in Mouse Land would be to spearhead the long-awaited online plunge by another little Disney subsidiary, ABC News. “The Internet represents what news on demand is all about,” ABC chair Boone Arledge says, vowing to make the new venture “the world’s premier Internet news service.” Also in on the deal are Netscape and AOL, with a combined 16 million online visitors daily. In other words, television numbers.

Ironically enough, the squeaky-clean Mouse connection probably bars Sports-

Zone from the one feature that some analysts think could be online sports’ true killer app: instant betting. The billion-dollar allure is obvious – so much so that Washington lawmakers are already talking about trying to ban Internet wagering. But even without Disney, Starwave already has partners – the NBA and the NFL, for starters – who don’t want to hear the word *gambling*. And as an NBA owner, Paul

at a roadhouse saloon straight out of *Twin Peaks*. Naughton’s still rolling. “The clean-and-simple user experience belies the complexity and completeness of our underlying software system,” he says. “Unlike any other software environment in the world, we manage to harness the dynamic nature of the Web with almost constant subtle technological refinement.”

Nine guys talk hockey and computers,

Naughton fires off slap shots, doing what SportsZone does best – make things look easy.

Allen couldn’t even think about it. Not that he needs the money.

But there are other things on my mind as I watch Naughton fire slap shots in a funky rink somewhere in Seattle’s northern reaches. I’m on the ice beside him, trying to balance on bad skates. But Naughton makes it look easy, which sums up what SportsZone does best – make things look easy and have fun doing it.

And then it’s Henry Weinhard’s time

who’s up and who’s down in the NHL, and how everybody played tonight. A second pitcher of beer arrives, there’s more hockey talk, then suddenly the conversation switches to something that sounds a lot more like Silicon Valley: how much someone they all know overpaid for a hot new car – what one of the assembled testosterone-pumped geeks calls “a big dick on wheels.” In the big leagues, wherever they are, boys seem to still be boys. ■ ■ ■

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FIREWALL

◀ 150 According to Zhuang Dundi, the suited college student who earns spare cash as the café's tutor, "So far, we've had no incidents." It's not hard to see why. "We have three levels of 'firewall,'" he says. "Our company filters things once, ChinaNet itself has its own filtering system, and then we keep an eye on everything here."

Despite the less than user-friendly environment, Sparkice can attract upwards of 100 patrons a day. Most are foreigners – especially homesick students – or people thinking about getting wired themselves, mainly white-collar workers from joint-venture companies. For Chinese college kids, the prices are astronomical: a Y100 (US\$12) deposit up-front, then Y30 an hour, plus Y15 for every 10 minutes of

also ensure stability for China. I think Singapore has the right approach. They have been energetic in their development of the Net and tireless in managing it. Their tough line is worthy of emulation; a laissez-faire attitude is destructive and must be rejected.

At a friend's on-campus apartment, a 15-year-old boy who attends a prestigious Beijing middle school talked about his experience with the Net:

I have the advantage of 'superhighway driving on public gas' – I go online through my mother's work unit, which subscribes to ChinaNet. If I had to pay for Internet access myself, my parents would murder me.

I'm no Net-insect – I've only been at it a few months. Hey, I'm only in my third year of middle school, and my English sucks.

There's people around who are really into surfing – all I can do is bumble around, though I do find some good stuff by chance.

Sure, I could get onto the real Internet by ringing a Hong Kong or Taiwan access provider. The work unit wouldn't be able to tell who was ringing out, but if I stayed online for very long it'd cost a fortune in international phone bills, and my family would have to pay. My mom would kill me for sure.

I suppose the NetWall is all about keeping pornography out of the country.

They've blocked things like Playboy, for example, but that's hardly going to stop you. If you really want to find stuff, then you'll get through the wall – you just have to know how. Anyway, there are things that are much worse than Playboy, and it's easy to get access through sites in northern Europe or Japan. Once you hit upon one, you just take a trip round the neighborhood through links they provide, and you've got yourself a gold mine.

But porn on the Internet is a bore, all static images or small-frame videos. It's not nearly as much fun as watching a

good video. As for 'reactionary propaganda,' I'm just not interested in it. I don't even go looking.

SHANGHAI STYLE

Shanghai has always been China's cosmopolitan entrepôt. It's also where the virtuous realities of Comrade X and talk about Singapore models give way to the down-to-earth facts of market forces and resourceful practicalities.

Pan Weimin, a thirtysomething electrical engineering graduate from Shanghai's prestigious Fudan University, runs the day-to-day operations of the PaCity Computer Company, which makes and sells computers and peripherals.

The aim of going on the Net is to be able to communicate and exchange with other people or engage in business. It's a two-way highway. If the Net becomes a national net, limited to a certain culture, then what's the long-term use of getting wired?

Pan practices what he preaches. To promote its machines, PaCity runs a bare-bones "café" with eight online computers in Putuo, the heart of Shanghai's electronics industry.

People can come and use the equipment for free – it could never survive as a café anyway if we tried to live off our customers. But there's another thing: if we started charging, we'd have to get every user, casual or not, to register with China Telecom and the PSB. As is, we can pretend we're demonstrating our computers and training potential buyers. So we're free of control. Otherwise, both the police and the entertainment bureaucracy would be on our backs.

There's nothing he can do, of course, about China Telcom's filtering. And whatever kind of loopholes he or others can find are a long way from letting real Net geniuses out of the bottle:

When push comes to shove, the authorities don't have to restrict themselves to imposing a NetWall around China. They can use tried and true traditional methods: one administrative order from on high and everything can be shut down. It's simple and effective.

BRAVE NEW NET

It should not surprise anyone that the Chinese authorities see the Net's opportunities, along with its threats. Time and again, the 20th century has proven the value of information technology for building a heaven for bureaucrats – or for secret police. For Communist Party

Shanghai's East China Computer Company sells both hardware and Net access. Manager Jing Hailing (top left) displays a brochure for China InfoHighway, a new online service.

Beijing computer game fan Xiao Ma (below) has more than 100 CD-ROMs. A newcomer to the Internet, he says he spends most of his online time in chat rooms.

Opposite: highway construction in Shanghai; bicycle porters in Beijing's Zhongguancun electronics district, who charge by weight to move stacks of new equipment.

overtime. Tutorials from Zhuang Dundi are available at Y40 an hour; drinks are Y25 each. At this rate, an hour of mindless Net escapism plus a couple of Cokes will consume 10 percent of the average Chinese student's already spartan monthly budget.

Those limits don't bother café manager Bai Jinghong, who has the official line down pat:

Absolute freedom is an impossibility. It would create anarchy. To censor harmful things doesn't just ensure that the Internet can develop in a healthy fashion; it will



cadres, that means a network devoted to the transmission of party directives, government orders, and local bureaucratic folderol – in other words, an intranet. The ever-vigilant PSB already has one, linking it to every major hotel and guest house where foreigners stay. The minute you register at your five-star joint-venture hotel, Comrade X and his associates know you're there.

Elsewhere, such efforts are still mostly works in progress. In Guangdong province, for instance, few local-level party offices have the bandwidth – meaning more than a single phone line – to keep their computers permanently online. So headquarters first has to telephone to say that a document is on the way, then local officials turn on their modem to receive it, along with the relevant party secretary's seal of office – suitably encrypted – and signature. Clunky and primitive it may be, but it works. And an infrastructure that will wire the whole province is well under way – Communist Party offices first, of course.

One university computer specialist we talked to in Guangzhou has been called in to help with several of what he waggishly calls "DocuNets":

The bureaucrats don't give a damn about the Net or connecting with the outside world. What everyone is really getting into – as long as they have the money to do it – is establishing their own local networks. When they receive a telex from Beijing, they get their secretaries to type it into the computer, and then use the DocuNet to distribute it. It's the latest in paperless offices, and they want it.

MONEY TALKS

There's an old saying in south China: "The heavens are high and the Emperor is far away." From the late 1970s – the dawn of the post-Mao era – people in the areas of Guangdong province bordering on Hong Kong were among the first mainland Chinese to glimpse the outside world through Deng Xiaoping's then-new "Open Door." They were also the first to be able to start turning off Central People's Broadcasting and tuning in to the British colony's televised version of capitalism's decadent charms.

Will the Net follow a similar path? One affluent electronics buff in Guangzhou, the provincial capital, is looking for new opportunities after making a killing in the last few years selling computers made with pirated processors from Taiwan. He

offers a classically hedged south China viewpoint:

You only have to think back to how things were in the early 1980s. Then a major political issue was the direction you pointed your TV antenna – toward Hong Kong or inland. The struggle went on for years – the police carried out door-to-door checks, people were ordered to pull down their aerials, and party members were warned they'd be expelled if they watched. Then underground factories that produced signal boosters mushroomed, and soon everyone was watching Hong Kong TV without a visible, external aerial. It

"People will just have to accept that the government blocks some things. If the foreign media makes a big stink about it, don't worry, it will pass. The people interested in the Net's commercial possibilities will carry on regardless. Let's face it: Be it China or America, the government's voice is not as loud as that of business. Those who are willing to put up the money will have the last word."

became such a farce that in the end the authorities simply gave up.

But these days, it's not only this side that is different. TV stations in Hong Kong have been changing. They want to reach the massive market that covers the whole Pearl River Delta. And to get that, they are making compromises about content – they won't show anything that's too provocative. It's the nature of business; if you want it, you have to make concessions.

If the Net's going to be a success in China, people will just have to accept the fact that the Chinese government blocks some things. If the foreign media makes a big stink about it, don't worry, it'll pass. The people interested in the Net's commercial possibilities will carry on regardless.

Let's face it: Be it China or America, the

government's voice is not as loud as that of business. Those who are willing to put up the money will have the last word.

THE GREAT NETWALL

The computer cordon sanitaire that Chinese authorities are trying to build around China is called the *fanghuo qiang*, or "firewall," a direct translation from English. But a more popular phrase for it is *wangguan*, literally "NetWall" – a name harking back to an earlier effort to repel foreign invaders. As every Chinese school kid knows, the original Great Wall failed in its basic mission (though it did better



as a communication avenue). Will its digital successor fare any better?

The PSB's Comrade X sees both the scope of the problem and the need for what strategists call "defense in depth":

Nationwide regulations are being formulated, but because these will involve so many other laws and areas – advertising, news, and so on – it will be impossible for us to draw up comprehensive legislation in the short term. At the moment it is up to the ISP and the individual to be responsible for the regulation of newsgroups and the leaking of state secrets.

A professor at a Guangzhou electronics college has a different view:

The NetWall is something born of a typically Chinese mind-set. Perhaps it's just a matter of face-saving. People in the **176 ►**

FIREWALL

◀ 175 *government feel they've got their backs to the wall. They're not stupid. They know full well how viciously everyone denounces them every day in private.*

DIGITAL ISLANDS

In the People's Republic, coded communications are second nature, developed over years of mass surveillance, people reading other people's mail and diaries, tapping phones, and generally being inquisitive about your affairs. The idea that the walls have ears doesn't shock anyone.

In conversation, for instance, comments about the weather often carry a political subtext. Low temperatures and storms indicate that the shit has hit the fan; extreme heat can mean that things are precarious for the individual, their company, or inside the government. The Chinese language's rich imagery and telegraphic allusions can make it hard for censors to discern subversive messages from poetic flights of fancy.

Not that it stops them from trying.

The authorities have seen what can happen when the information revolution

takes a swipe at its socialist predecessor. Last summer, during a furor – initially encouraged by the authorities – over Japan's occupation of the historically Chinese Diaoyu (Senkaku) Islands, students used the national university network to organize demonstrations. They also transmitted news of the protests, much of which was going unreported in the nervous official media. In this case, the censorship was as crude as it was effective: the most prominent online activist was quickly banished to remote Qinghai Province, and for 10 days, all university access to newsgroups was shut down – those in English (favored by scientists) and in Chinese alike.

The move coincided with an ongoing general crackdown on dissent. Semi-independent journals and newspapers have been banned, writers and intellectuals harassed. The few active dissidents who have managed to stay out of jail (or, more commonly, exile) have had to be even more than usually circumspect about their contacts with the outside world.

One who manages is the controversial environmentalist and investigative historian Dai Qing. Frequently detained by the

authorities, she sees the Net as a lifeline to friends and supporters outside China. "Whenever I get back to my apartment, the first thing I do is check my email. In Chinese there's a saying: 'The ends of the earth can be brought close to you.' That's what email allows me to feel. To be in constant contact with people throughout the world gives me a sense of security."

Since the crackdown, the Net – however problematic – has also become one of the few remaining sources of unofficial news. The main online Chinese-language information sources – the Hong Kong and Taiwan presses, and the China News Digest – are among the NetWall's high-priority targets. But anyone with access to the Net and a little skill can find uncensored information – even something as simple as weather-oriented email messages – that fill in the blank spots created by the authorities, whether regarding dissidents, rumors surrounding the demise of Deng Xiaoping, or Islamic separatist bombings in downtown Beijing.

Other tiny digital islands exist – an online magazine for Beijing's "unofficial" art scene, run by two expat Japanese, for example, and another site where a small

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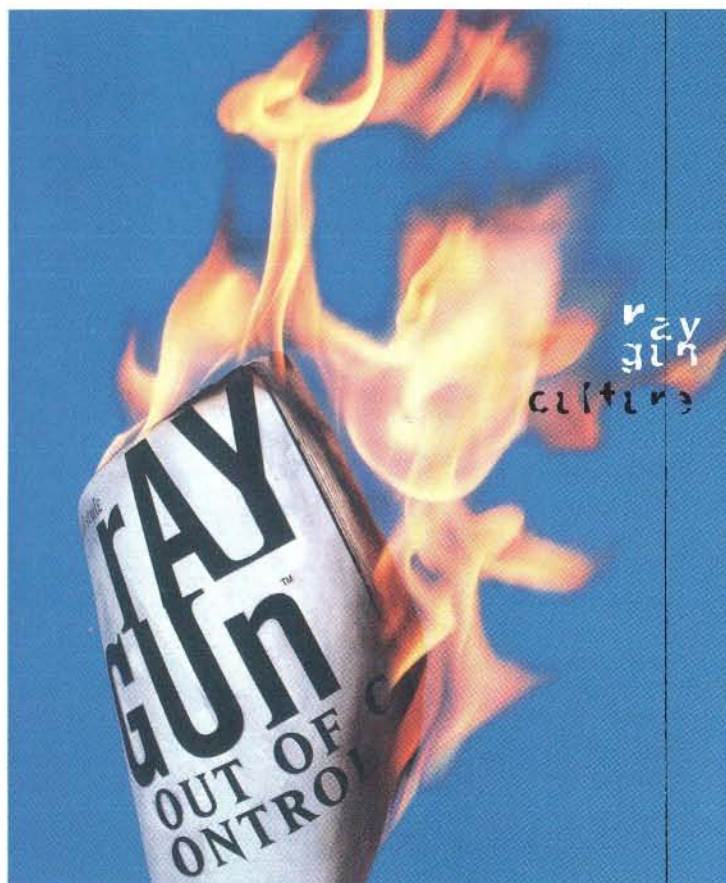
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FIREWALL

group of mainland gays sends out news about their lives and activities to the wider world. How long this will last is anyone's guess; Chinese authorities often let things happen until problems arise. As Comrade X put it in his gnomish style, "You make a problem for us, and we'll make a law for you."

JUDGMENT DAY

It would be easy enough in China to radically limit the Net's spread. But companies like China InfoHighway have a more focused agenda: turning information technology to their own, avowedly chauvinistic, advantage. It's not official policy, but it's close. And it certainly reflects the attitude of thinly disguised nationalist grievance that informs so much of China's current relations - the debates over Hong Kong, Taiwan, and Tibet, for starters - with the rest of the world.

Here's another serve from Xia Hong, China InfoHighway's PR man:

The Internet has been an important technical innovator, but we need to add another element, and that is control. The

new generation of information superhighway needs a traffic control center. It needs highway patrols; users will require driving licenses. These are the basic requirements for any controlled environment.

All Net users must conscientiously abide by government laws and regulations. If Net users wish to enter or leave a national boundary they must, by necessity, go through customs and immigration. They will not be allowed to take state secrets out, nor will they be permitted to bring harmful information in.

As we stand on the cusp of the new century, we need to - and are justified in wanting to - challenge America's dominant position. Cutting-edge Western technology and the most ancient Eastern culture will be combined to create the basis for dialog in the coming century. In the 21st century, the boundaries will be redrawn. The world is no longer the spiritual colony of America.

Judgment Day for the Internet is fast approaching. At most it can keep going for three to five years. But the end is nigh; the sun is setting in the West, and the glories of the past are gone forever.

China InfoHighway is a major player in what its brochures call "the Chinese

information supermarket." Its managing director, a well-connected woman named Zhang Shuxin, isn't shy about her ambition to be the "Bill Gates of China." But when we asked other Internet specialists - a technician at Beijing University, the manager of China Telecom, even Comrade X - what they thought about Xia Hong's boasting, they replied with variations on the same answer: "Those people are completely out of touch with reality."

But then reality in modern China has always been a tentative concept.

Zhou Hongwei is a senior engineer with Shanghai's Ge'er Electronics Corporation. He uses his spare time to help local academics get online:

A few years ago everyone was asking, 'Have you started up your own company yet?' Then it was, 'Do you have a driving license?' followed by, 'What model computer did you get?' Last year the big thing was, 'Are you into multimedia yet?' Today it's, 'Are you wired?'

No one really cares if you are actually wired. Forget about what the Net is for and what it might become. People only want to show their friends that 178 ►

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FIREWALL

◀ 177 *they've done the right thing and got themselves wired.*

ROADS AHEAD

China in the 1990s is a country embarked on what some local economists call "the acquisition of primitive capital." Individuals, companies, and state enterprises are all vying for advantage in the rough-and-ready atmosphere of a unique historical moment: simultaneous industrial and information revolutions in the oldest, most populous nation on earth.



For all their unabashed efforts to control the Net in China, the authorities and their entrepreneurial offspring can also see its potential, at least for generating profits. That's one reason the most strident antiforeign rhetoric comes not from pragmatic technocrats like Comrade X, but from fledgling local capitalists and professional xenophobes, who have their own obvious reasons for wanting anything foreign – including potential competition – kept in its place.

Last December, the conservative Beijing journal *Strategy and Management* published a commentary by Yang Xue-shan, head of the State Information Center's Capital Investment Office:

Following the end of the Cold War, certain developed nations (meaning the

United States and its allies) are determined to protect their own interests by labeling themselves as internationalists. They pretend to be the benefactors of all mankind, while constantly expanding their sphere of influence and attempting to contain the development of others. ... They want to envelop everything in their information umbrella.

Paranoid nationalism is not just good politics – it's a useful way of garnering support for homegrown solutions. One of the most prominent of those is the China Wide Web, a joint venture of the official New China News Agency and China

Internet Corporation, a "patriotic" Hong Kong company. Inaugurated last October, the CWW (www.china.com/) is creating a nationwide Chinese commercial network, all guaranteed spiritually pollution-free. Meanwhile, much-watched digital model country Singapore is blazing a path with Singapore One, an exclusive "supernational intranet"

For a lucky few, the Net offers escape from an information desert. In his Beijing apartment (top), one clever surfer runs CNN Interactive round the clock. Below, at the Keep in Touch Bar – a one-computer Internet café – artist Tao Ling and friends discuss whether to burn the bills he ran up registering a domain name.

to be launched later this year, with all the advantages of the Internet and none of the "problems." The digital gated community, infohighway as one-way street. It won't pass muster in San Francisco or Sydney, but that's no reason it can't work.

For now, the Net in China will remain a privileged realm, enjoyed by the well heeled and well educated, by foreigners, and by the government itself. The cabal of policy makers that is advising the national leadership – Public Security, China Telecom, politically well-connected entrepreneurs – is by no stretch of the imagination enlightened, digitally or otherwise. Internal debate will continue – which organizations or individuals will be allowed to get wired, which will be refused, what those who are online will be allowed to

see, and who will profit. The one certainty, given the headstrong Chinese bureaucracy and the Maoist mentality that spawned it, is that China's adaptations of the Net will be unique, and probably bizarre by Western standards.

China's Open Door policies have had momentous, mostly uncalculated consequences. But that doesn't mean that the China of the future is going to look more and more like us. It is going to continue to look like China – and will have the wherewithal to do so. As China gets stronger and more wired, it will still be limited by intellectual narrowness and Sinocentric bias. Pluralism and the open-mindedness that comes with it – the worldly curiosity of previous great powers and the idealism that often supports it – simply are not present. More to the point, they are not about to be encouraged.

DARK GUESTS

Many Chinese computer terms are homophonous transpositions from English. The expression for *hacker* is *heike*, literally "dark guest." As travelers in China's Net world, we were sometimes regarded as slightly suspicious visitors. One army general's son – himself a classic nerd who runs his own computer graphics company – said point-blank, "What are you people doing here in China? Foreigners have never done us any good."

He fell silent when reminded that without his Western glasses, designer running shoes, computer technology, and command of English, his Sinocentric world might be far more narrow and lackluster.

A young Beijing woman who works as the night manager at a Sino-Japanese joint-venture hotel whiles the hours away "roaming at will" on her office computer. With access to foreign currency, she's an avid online consumer who's already used the Net to make a few modest purchases from abroad – à la mode sportswear and assorted accessories.

They're the latest fashion, and it's worth it. Of course, there are things I can't afford, like a swimming pool or a circus elephant or real designer clothes. But there are people out there who can. I don't have the wherewithal now, so I know I have to work harder and make more money.

And what about someone without a credit card? She was honestly bemused:

If you don't have a credit card, what in heaven's name are you doing on the Internet in the first place? ■ ■ ■

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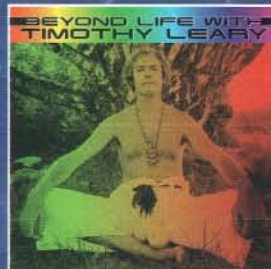
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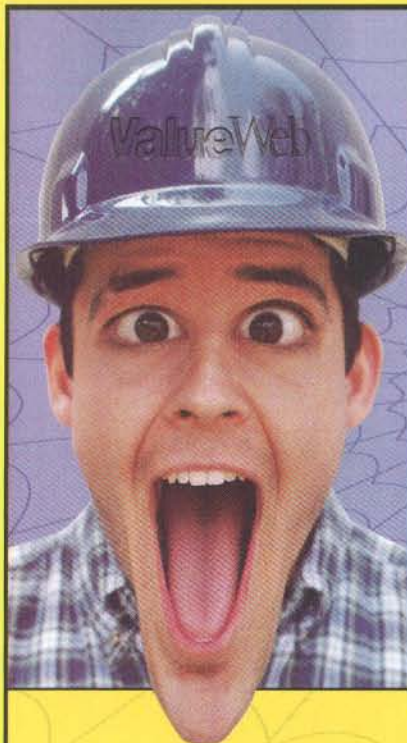
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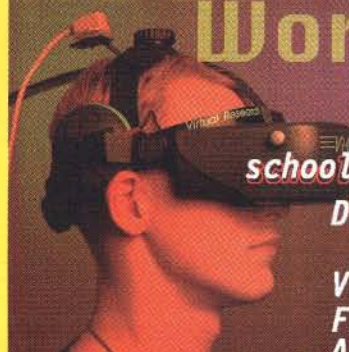
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HONG KONG

◀ 151 Might those restrictions apply to electronic rights as well? "It's entirely likely," says James McGregor, director of Hong Kong-based business consultancy J. D. McGregor Ltd. "Somewhere down the road, China could make use of what technical means it has to restrict the Internet."

Those "technical means" could take many forms, ranging from a Singapore-style proxy server approach, in which ISPs are forced to weed out Web sites the Chinese government deems offensive, to filtering of financial news from sources such as Dow Jones, Bloomberg, and Reuters by the government-controlled Xinhua News Agency, as is the case in mainland China.

Hong Kong's government may have already employed high tech tactics. Last October, Wang Dan, a noted activist involved in the Tiananmen Square civil rights protests, was sentenced to 11 years in Chinese prison. Hong Kong radio broadcasts about the sentencing were posted on the Internet for worldwide dissemination.

But for two days, Internet users overseas complained that sound was inaudible or blocked entirely. Says Ben Yoong, a Hong Kong Web site designer, "It may have been technical, but the widespread suspicion (that the interference was intentional) tells you something about how concerned people are."

Yoong believes suppression of free speech on the Internet may begin with monitoring of both private and public email and may lead to use of email records as court evidence. "People will really be scared if one or two of their email messages or their comments in online forums get brought into the courts," he adds.

FINANCIAL JITTERS

Such privacy concerns as these have caused uneasiness in Hong Kong's network of multimillion-dollar businesses, particularly those in the financial community.

"Certain banks, such as those in the EU, will not transact with institutions that don't observe certain regulations with regard to privacy," says Susan Schoenfeld, president of Advisors for International Media Asia Ltd.

David Carse, deputy chief executive of the Hong Kong Monetary Authority, claims there is no indication that privacy safeguards concerning financial data will be diminished; nevertheless, there's a chill in the air.

"When China makes noises about changing laws, it throws everybody into orbit," says Simon Murray, executive chair of Deutsche Bank for the Asia-Pacific region. "To banks, privacy is like gold dust. If there's anything that interferes with the way in which we do business, and the rights we have to do our business, people will say, Fine, we'll go somewhere else."

Result: a quiet flight of capital from Hong Kong has occurred as companies depart for more open Asian business environments such as Singapore and Malaysia.

For those that remain, quiet acceptance and self-censorship may ultimately prevail. "Our position is, Don't ask, don't tell," says Charles Mok, general manager of HKNet, Hong Kong's fifth-largest ISP. "People aren't avoiding the issue, but they probably don't see the need to ask China if it's going to regulate us more."

The promise of gaining access to one of the largest consumer markets in the world may stifle any potential criticism from the local business community. One intoxicating attraction is the mainland's telecommunications market, which has yet to open except to equipment suppliers. When free trade begins, Hong Kong telcos will be salivating for the business and will be potentially more amenable to meeting Beijing's stringent demands for Internet control.

"If the Chinese cracked down on the Internet, the average businessman would not move out," McGregor says. "These are not such dramatic things that com-

panies would be affected in terms of profitability."

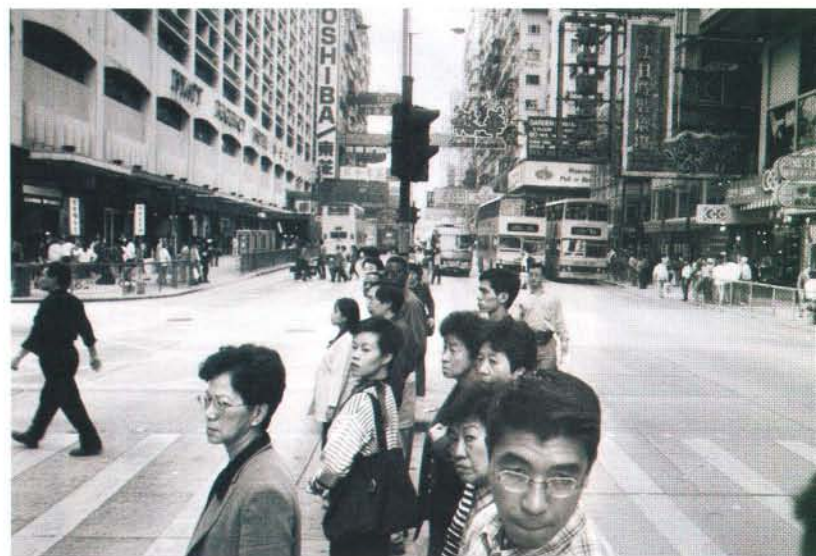
Selective monitoring is already business-as-usual for foreign firms doing business with China. "The ISPs in this town are used to working with censorship regulations," says Joe Sweeney, vice president of marketing for Asia On-Line, one of Hong Kong's largest ISPs. "China doesn't need to apply any laws – they're already here."

Chinese censors would face a daunting technical challenge if they tried to monitor all of the Internet traffic passing through Hong Kong. "The manpower

ease Chinese monitoring.

Some longtime Hong Kong residents believe that merely the hint of an organized electronic protest could precipitate a devastating crackdown. Last September, for instance, student activists in Beijing and Hong Kong staged a coordinated gathering over the Internet, challenging Chinese claims toward the Diaoyu Islands, possession of which is under hot dispute between China, Taiwan, and Japan.

This electronic organizing made the Chinese government uneasy, and it later blocked



For the ordinary people who remain after China moves in, quiet acceptance and self-censorship may ultimately prevail.

needs would be extraordinary," says a local ISP's technical support manager. Mok and others argue that Hong Kong's sprawling telecommunications infrastructure – including four major telcos, more than 40 ISPs, about half a dozen cellular providers, and a wealth of private networks – would make it impossible for the government to enforce the use of proxy servers. However, the Chinese could limit Internet use through licensing, as they've done on the mainland. The city's Internet market is dominated by only about a half dozen ISPs, such as Hongkong Telecom, and even such market leaders as Asia On-Line expect the ISPs to consolidate. Such a shrinkage would

some of Hong Kong's most active Web sites. With new restricted rights of public assembly in Hong Kong, more Internet-facilitated protests could potentially follow, and that could be precisely what it takes to make China close its fist around the flow of information into the newly integrated territories.

"It's just the perception of a threat," says Lau. "But the question still remains, What would trigger such an action? If the Chinese perceive things to be getting out of control, then all bets are off. There is no reason to think that the Chinese are going to be threatened by Hong Kong. But if they are, we're all in deep trouble." ■ ■ ■

Colophon

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Typography: Text: Adobe Myriad and Wiredbaum. Heds: Adobe, FontShop, [T-26], House Industries, FUSE.

Graphics support: Adobe Premiere; Equilibrium Technologies DeBabelizer.

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Color separations are made on a Linotype-Hell Chroma-Graph S3900 scanned directly to optical disk. Preliminary color corrections are performed on a Scitex Righttouch and proofed on the paper stock using a Kodak Approval digital color-proofing system. Additional electronic prepress is performed in-house at *Wired* using scans from the Linotype-Hell ChromaGraph S3900, Agfa SelectScan Plus, Arcus II, and Vision 35 scanners, and Kodak PhotoCD. Composed pages are converted to PostScript through a PS2 and translated into Scitex language using software version 4.12. RIP'd files are sent to the Scitex Prisma workstations. Composed digital proofs are submitted for final approval. Final graphic images and text are electronically imposed using a Creo Thermal Platesetter 3244. Printed on multiple Heidelberg Harris M-1000B web presses.

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Wired, June 1997. Volume 5, Issue Number 6.

Wired (ISSN 1059-1028) is published monthly by Wired Ventures Inc., 520 Third Street, Fourth Floor, San Francisco, CA 94107. Subscription rates for US and possessions are US\$39.95 for 12 issues, \$71 for 24 issues. Periodicals postage paid at San Francisco, CA 94107, and at additional mailing offices.

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T H E N E T I Z E N

◀ 56 he says. Such comments are reassuring, but like any veteran bureaucrat, Hundt seems eager to find a middle ground between the telcos and the Net. Thus, he has also offered his own solution. Right now, residential phone lines are cheap because federal and state agencies have mandated increases in the cost of long distance calls and premium services like call waiting to subsidize basic dial-tone access for everyone. Hundt has suggested removing these subsidies from second phone lines. In the absence of local-loop competition, his proposal would potentially double the price of a second line. But it would also give the telcos less to grumble about.

Hundt has only one vote on the four-member Federal Communications Commission (the fifth spot remains vacant at the time of this writing), but other commissioners seem to agree with his position. "We're going to walk very carefully so as not to impede progress or competition," insists Commissioner Susan Ness. Indeed, when the group held a preliminary vote on access charges last December, it ruled that Internet providers should not be subject to access charges of around 3 cents a minute. Since today's system is so screwed up, the agency said, "We see no reason to extend this régime to an additional class of users, especially given the potentially detrimental effects on the growth of the still-evolving information services industry."

The Net had – once again – found an improbable ally in the FCC. But the love-fest may be short-lived. The ruling left the door open for the commission to impose access charges of less than 3 cents, and the telcos are now asking for a penny a minute.

Inside the Beltway, the buzz is that the FCC won't impose new access fees anytime soon. But no matter what the commissioners decide, the losing side is likely to take its grievances to the Senate's Commerce, Science, and Transportation Committee, which oversees the agency and could overrule its decision. The Commerce Committee's new chair, Senator John McCain (R-Arizona), harbors little sympathy for the telcos – or their lobbyists. (See "The McCain Mutiny," page 122.) After presiding over a recent hearing on

universal service, McCain began spreading the word that he opposes new access charges. "The claims that are being made by the telcos are somewhat exaggerated," he says. "I'm persuaded that online access isn't nearly the burden they are complaining about." McCain's assessment is not universally shared – Alaska's Senator Ted Stevens, a senior Republican on the committee, said in March that Internet services should be regulated as telephone companies, and forced to pay some form of access charge or universal service fee.

The ad hoc alliance

All of which means that the peculiar synergy that exists between grassroots Internet users and high tech corporations remains as important as ever. In the face of the telcos' onslaught, netizens are joining ranks with business interests to lobby the government and protect the Net. Although the flood of angry email that stuffed the FCC's in-box was a chaotic, word-of-mouth effort, it worked wonders – and effectively changed the course of the debate in DC. "I think people in Washington recognize that the 300,000-message deluge was just the tip of the iceberg," says Paul Misener, Intel's chief (and only) telecom lobbyist and coordinator of the Internet Access Coalition.

Yet in a very real way, the digital nation had misidentified its foe. As a rule, Washington's bureaucrats are not power-crazed authoritarians; most are reactive creatures who simply respond to demonstrations of influence and power. Bell Atlantic, PacBell, Nynex, et alia leaned hard on the FCC for access fees, and the agency reacted in its own instinctively bureaucratic way. The high tech community responded by forming its own ad hoc coalition to pressure the FCC, and thousands of Internet users chimed in to express their collective dismay. Of course, the best way to win not just the battle but the war may be to remove the commission's power to regulate the Net altogether. Still, so far the real threat to netizens has come from complacent telcos and their legions of starched-collar lobbyists, not the FCC. The distinction is important, because the old rule of thumb still holds true: The enemy of our enemy may occasionally prove to be our friend. ■ ■ ■

Message: 48
 Date: 6.1.97
 From: <nicholas@media.mit.edu>
 To: <lr@wired.com>
 Subject:

There is a new force in the world: the growth of cyberspace. Inherent in this force is a breakdown of barriers. Everyone talks about crossing barriers of geography, gender, and culture. But the most important barrier is perhaps the least appreciated: the barrier of age. Empowering kids is a double whammy because they're the ones who will most effectively break down the other barriers as well. The children of the world are critical to achieving a united world.

Those of us who grew up in multiracial societies are likely to be more racially unprejudiced than our parents. I see the same difference in people younger than me, who grew up in a more gender-enlightened era; many just cannot understand how much of an issue gender was in my time. I bet the kids of tomorrow will have the same feeling

2B1

had just published *Mindstorms*. Papert's theme of "teaching children thinking" was a natural complement to *The World Challenge*. And, with the initial backing of the then-wealthy OPEC, these crazy ideas started to make sense. Saudi leader Ahmed Zaki Yamani delivered a powerful address on human development that fall in Vienna. Paraphrased, he said, don't give a poor man fish, give him a fishing rod. The leap from a fishing rod to a personal computer was, for some of us, easy.

The center's work focused on the use of computers for primary education in developing nations. The first site was a school outside Dakar, Senegal. This small experiment was just terrific; the kids had most fun teaching the principal. Kids from the jungle learned faster than kids from the city.

whose purpose is to bring the digital world to kids in those places least likely to provide access to it. The idea is not to go country by country, but to target the world as a whole. Sounds cuckoo, but it isn't, because the Net itself and the children using it now are very much part of the solution.

In parallel, the MIT Media Lab is also focusing on children, learning, and human development. The scientific and technical questions it faces range from language translation to storytelling to cultural understanding to the roles of nonverbal language.

Developing digerati

On July 17, MIT and 2B1 are cohosting a five-day workshop that will bring together people who have taken bold initiatives in bringing computers to children who live in technologically isolated places. For example, teachers who have defied the logic that you need to provide more chalk before you bring a computer into a primary classroom. Or social activists who have brought computers to street children who don't have schools at all. But especially those who have found ways even more imaginative to bring children into cyberspace.

Check out www.2b1.org/. We will pay travel, room, and board expenses for as many people as we can afford, with a strong priority given to getting at least one or two individuals from every developing nation. Do you know somebody who should attend?

Our goals for the meeting include developing a 2B1 plan of action, collaborating with existing groups, and establishing a major granting program of hardware, telecommunications systems, and know-how. Feels big? You bet it does. But just like the distributed Internet, this too can grow. In fact, the Net is the encouraging force. It is both global and popular – and what we did not have in 1981. ■ ■ ■

2B1 is a nonprofit foundation, whose president is Peter Cawley (peter@2b1.org), vice chair and chief scientist is Seymour Papert (seymour@2b1.org), and director of product development and interface design is Dimitri Negroponte (dimitri@2b1.org). Other participants include myself, Saj Nicole Joni, Tom Grant, Rodrigo Arboleda Halaby, and others mentioned at the Web site.

Next Issue: Digital Obesity

What sense is there in providing computers to children in nations where there is inadequate food, clothing, and medicine? The short answer: lots.



about nationalistic thinking. In fact, we are looking at a generation that will feel about culture the way most of us today feel about race and gender – identity and unity, being individual and plural at the same time.

What's wrong with this picture is that more than 50 percent of the 1.2 billion children ages 6 to 11 have never even placed a phone call. Yet the suggestion to give the kids of the world access to technology raises an obvious question: What sense is there in providing computers and Internet access to children in nations where there is inadequate food, clothing, and medicine?

The short answer: lots.

Déjà vu

In 1981, French president François Mitterand gave author Jean-Jacques Servan-Schreiber the mandate to establish a World Center for Computation and Human Development. The idea was based on Servan-Schreiber's book *The World Challenge*. Simply stated, developing nations should and could leapfrog the industrialization process and jump into the trade of bits, instead of atoms.

What gave this idea substance and credibility was the work of Seymour Papert, who

The second location was Colombia; it had the full personal commitment of President Belisario Betancur Cuartas. For a short period, this outrageously bold idea looked like it was going to be the beginning of something very big and important.

It was not. Within months, the original mission was pushed aside in favor of addressing more immediate needs in France, where, after all, the center was based. Within less than six months, the "world challenge" was replaced with "France's need" – installing a national fiber-optic system.

Timing

The 1981 Paris initiative was way ahead of its time. Even if it had not unraveled for other reasons, it would have failed because of the absence of global telecommunications and the rarity of personal computers. The IBM PC had not even been introduced in Europe.

Today, the timing is right. Two major forces fuel this timeliness: worldwide awareness and use of the Internet and the spread of personal computers into the lives of children – at school and at home.

Because of these forces, a group of us has created a nonprofit organization called 2B1,

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on a dark
and stormy night?

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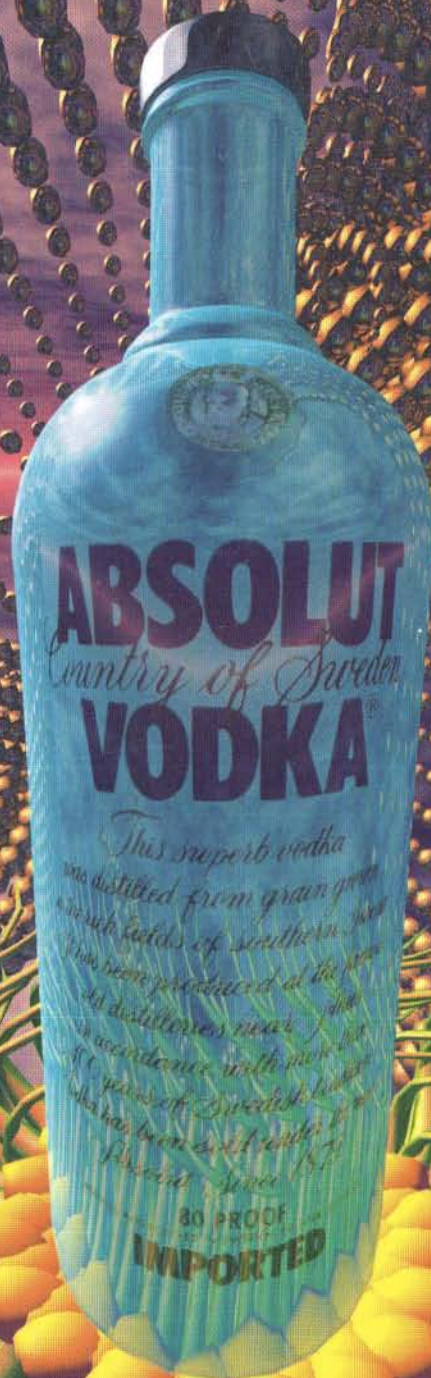
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